MAHILA VIKAS SANSTHA,WARDHA

INDRAPRASTHA NEW ARTS, COMMERCE AND SCIENCE COLLEGE WARDHA DIST 442001(M.S)

(Affiliated to RTM Nagpur University)
www.nacscwardha.org

1.1.1

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Question Bank UG & PG

Mahila Vikas Sanstha's
INDRAPRASTHA NEW ARTS COMMERCE & SCIENCE COLLEGE, AT POST NALWADI, DIST. WARDHA (M.S.)
Accredited 'B' by NAAC

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Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
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Department of Computer Science
SUBJECT:- ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM
Class:- M.Sc I Sem(NEP)
Question Bank

UNIT I

1. **Explain water jug problem stating state space.**
2. **Explain with example constraint satisfaction.**
3. **Explain the A* algorithm with suitable example.**
4. **Give an overview of Steepest-Ascent Hill climbing algorithm.**
5. **Discuss the AI problem.**
6. **List the different AI techniques used to solve it.**
7. **Write notes on : (1) Best-first Search. (2) Constraint Satisfaction.**
8. **List the different problem and production system characteristics.**
9. **Explain Design of Search Algorithm with example.**
10. **Explain with example constraint satisfaction.**
11. **Give an overview of Steepest-Ascent Hill climbing algorithm.**
12. **Explain different problem characteristics in detail.**
13. **Define state space and explain with example.**
14. **Explain Means-end analysis**

UNIT II

1. **Explain issues of knowledge representation.**
2. **Discuss expert system in detail.**
3. **What are the computable functions and predicates ?**
4. **Explain natural deduction in detail.**
5. **Differentiate between Forward and Backward Reasoning.**
6. **Write notes on : (1) Control knowledge. (2) Expert system.**
7. **Explain computable function and predicates.**
8. **Explain computable function and predicates**
9. **Explain alpha beta cut-offs.**
10. **Write the concept of Non-linear planning with suitable example.**
11. **Explain Min-Max algorithm with an example.**

12. What are the components of planning systems.
13. Explain Hierarchical planning with example.
14. Discuss the components of planning system. Why it is needed ?
15. Explain alpha beta cut-offs.

UNIT III

1. Write the concept of Non-linear planning with suitable example
2. Explain Hierarchical planning with example.
3. Discuss the components of planning system. Why it is needed ?
4. Why understanding is needed ? Explain understanding as constraint satisfaction.
5. Explain unification grammars and semantic analysis.
6. Explain use of pattern recognition in AI.
7. Write note on Syntactic processing.
8. What are the advantages of Distributed Reasoning System.
9. Discuss the understanding as constraint satisfaction.

UNIT IV

1. Explain the concept of resolution.
2. Discuss additional refinements.
3. Explain psychological modelling.
4. Explain alpha beta cut-offs .
5. Write the concept of Non-linear planning with suitable example.
6. Explain Min-Max algorithm with an example.
7. What are the components of planning systems.
8. Explain use of pattern recognition in AI.
9. Write note on Syntactic processing.
10. What are the advantages of Distributed Reasoning System.
11. Discuss the understanding as constraint satisfaction.
12. Define depth first search.
13. Explain the concept of resolution.
14. Discuss additional refinements.

Department Of Computer Science

Class: - B.Sc.-IV th sem

Sub: - Computer Science-Paper-I

Unit-I

1. What is JVM ? Explain different features of Java Language.
2. Write a Java program to display the total and average of three numbers.
3. Explain different operators supported by Java programming.
4. Explain Input statement for entering data through keyboard.
5. Explain the bitwise operators in Java.
6. Explain various JDK tools in Java
7. What data types are used in Java? Explain type casting with example
8. Explain the use of break and continue statement as goto statement in Java.
9. What is operator procedure? Give order of precedence of operator of the operators.
10. Why should the main method in Java programming need to be public, static and void? What does string args[ ] mean in main definition ?
11. Explain JVM and execution routine of Java program.
12. Explain Java program structure. Draw a well labelled diagram for Java program structure.
13. Write a program in Java to demonstrate single in

Unit-II

1. Give the difference between method overloading and method overriding.
2. Write a Java program to demonstrate single inheritance.
3. What is interface in Java? Give example to implementing interface.
4. Write a Java program to demonstrate the static method.
5. Explain various access specifiers in Java.
6. Write a program in Java to search an element in two dimensional array
7. Explain implementing and extending interface in Java.
8. Write a program in Java to accept a number from the keyboard and find the factorial of a number.
9. Write a program in Java to demonstrate single inheritance.
10. Write a program in Java to find the largest of three numbers.
11. Explain the switch statement in Java with suitable example.
12. Write a program in Java to find the factorial of the given number N using for loop.

Unit-III

1. What is thread? Explain the life cycle of thread.
2. Explain exception handling with suitable example.
3. What is API package in Java? Explain how a class is added to package.
4. Write a Java program to create an applet that receives three numeric value as input from user and display the largest of three.
5. Define packages. Explain various API packages in Java.
6. Explain the thread life cycle using well labelled diagram.
7. Write an applet to display the message "Hello Java".
8. Explain the exception handling model in Java.
9. Explain thread life cycle.
10. What is exception in Java? Explain how user can handle exception in Java with the help of example using try-catch-final block.
11. What is a package ? What are the steps to add classes and interfaces in a package ? Give suitable example.
12. What are the advantages of Java applets ? Write a program for applet that receives two numerical values as input from the user and then display the sum of these numbers on the screen.

Unit-IV

1. Explain input and output stream in Java.
2. Write a Java program to copy characters from one file to another file.
3. What is event driven programming? Explain with example.
4. Explain graphics object. Write a program that create Java application for drawing rectangle on frame.
5. Write a program in Java to draw an oval.
6. Explain the various containers in Java.
7. Explain layout manager in Java
8. Explain the input-stream class in Java
9. What is an event ? Explain event handling in Java.
10. What is stream ? Write a program in Java that reads data and writes the data from/to files. (Assume suitable file structure)
11. How can we set font style in AWT ? Explain any two font methods.
12. Explain drawLine( ) and drawRect( ) methods of Graphics class in Java with example.

राष्ट्रसंत तुकडोजी महाराज नागपूर विद्यापीठ, नागपूर

इंद्रप्रस्थ न्यू आर्ट्स, कॉमर्स अॅन्ड सायन्स कॉलेज, वर्धा

वर्ग : बी.ए. सत्र सहा

विषय : मराठी साहित्य

प्रश्नपत्रिका

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१. चरित्र म्हणजे काय? ते स्पष्ट करून चरित्राचे विविध वैशिष्ट्ये स्पष्ट करा. **१६**

किंवा

'एक होता कार्व्हर' या चरित्रातील कथानक तुमच्या शब्दात लिहा.

२. चरित्र म्हणजे काय? ते सांगून मराठीतील चरित्र वाङ्मयाची वाटचाल स्पष्ट करा. **१६**

किंवा

'एक होता कार्व्हर' या चरित्रातून अमेरिकेचे समाजदर्शन कशाप्रकारे चित्रित झालेले आहे?

३. खालील वाक्याचे संदर्भासहित अर्थ स्पष्ट करा. **१६**

१.''जार्ज, उद्या सकाळी आपल्याला त्या द्राक्षवाल्या यायगरकडं जायचंय बरं का!''

२.''थोडे दिवस हा अभ्यास बाजूला ठेवून तू चित्रकलेचं किंवा संगीताच शिक्षण का पुरं करत नाहीस?''

३. तो भला कृषितज्ज्ञ आमच्या संस्थेत रूजू आहे. त्याच्याच मार्गदर्शनाखाली संशोधन चालू आहे. त्यासाठी आम्हाला तीन वर्ष पुरेल एवढा खताचा साठा हवा आहे.''

४.''सांगायला वाईट वाटतंय. आम्ही निग्रो मुलांना प्रवेश देत नाही. माझ्या माहितीप्रमाणे असा प्रवेश मागणारे तुम्हीच पहिले आहात.''

किंवा

१. ''हे आहेत एका जातिवंत माळ्याचे हात. नुसत्या स्पर्शाने संजीवनी देणारे!''

२. ''उगी, उगी रडू नकोस. मी काही तुला मारण्यासाठी नाही उठवलं. कोण आहेस रे बाळा तू? इथे या पडक्या गोठ्यात का झोपला आहेस?''

३. ''अं, हं! मागे नको फिरूस, पुढे हो, वाजव. तुझे हात, तुझी बोटं तुझ्या आवाजाला साथ देणारी आहेत. तू जातिवंत कलाकार आहेस.''

४. ''मी तुम्हाला पैशाचं उदात्त, उच्च पदाचं वा कीर्तीचं आमिष दाखवू शकत नाही. पहिल्या दोन गोष्टी तुम्ही उपभोगत आहात, शेवटची तुम्ही कुठेही मिळवू शकाल.''

४. खालील प्रश्नांची थोडक्यात उत्तरे लिहा. **१६**

१. महानुभाव संप्रदायाचा आचारधर्म थोडक्यात स्पष्ट करा.

२. संत ज्ञानेश्वरांनी आपल्या गुरूला कशाप्रकारे वंदन केले आहे?

३. विसोबा खेचरविरचित 'षट्स्थल' या ग्रंथाचा परिचय आपल्या शब्दांत लिहा.

४. 'तुका झालसे कळस' असे का म्हणतात?

किंवा

१. महानुभाव संतांच्या कार्याचा आढावा घ्या.

२. संत ज्ञानेश्वरांच्या काळातील सामाजिक परिस्थिती विशद करा.

३. 'संत नामदेव हे उत्कृष्ट धर्मप्रचारक होते' या विधानाचे समर्थन करा.

४. संत तुकारामांच्या लोकप्रियतेचे रहस्य कोणते?

५. खालील सर्वच प्रश्नांची संक्षिप्तपणे उत्तरे लिहा. **१६**

१. चरित्र म्हणजे काय?

२. चरित्र लेखनाचे हेतू सांगा.

३. 'एक होता कार्व्हर' या पुस्तकातून शिकण्यायोग्य तीन गोष्टी सांगा.

४. जग जिंकण्याची ताकद कोणात असते, असे प्रा. जॉर्ज कार्व्हर सांगतात?

५. वाक्याचे प्रकार सांगा.

६. वाक्यविचार सकल्पना थोडक्यात स्पष्ट करा.

७. प्रमाणभाषा व बोली यातील फरख स्पष्ट करा.

८. पोटभाषा म्हणजे काय?

1. By using ∈-δ technique of limit of a function, show that $\lim_{x\to 1} 3x2 + x = 4$.
2. Examine the continuity of the function f defined as :

$$f(x) = \begin{cases} 2 + x & ,x \leq 1 \\ 4 - x & ,1 < x \leq 2 \\ -2 + 3x - x2 & ,x > 2 \end{cases}$$

at the points x = 1 and x = 2.

3. Let f(x) = x · sin(1/x) ,x ≠ 0
   = 0 , x = 0
   Show that f is continuous but not differentiable at x = 0.
4. If y = a cos(log x) + b sin(log x), then show that :
   $x^2 y_{n+2} + (2n + 1)x\, y_{n+1} + (n^2 + 1)y_n = 0$.
5. Prove by Maclaurin's theorem, that:

$$e^x . \log_e(1 + x) = x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^5}{5!} + \cdots$$

6. Find the radius of curvature for the cycloid x = a(t + sin t), y = a(1 – cos t) at t = π/2.
7. Find the asymptotes of the curve:
   $y^3 – 5xy^2 + 8x^2y – 4x^3 – 3y^2 + 9xy – 6x^2 + 2y – 2x = 1$.
8. Evaluate :
   1. $\lim_{x\to 0} x \tan\left(\frac{\pi}{2} - x\right)$
   2. $\lim_{x\to 0} (cosec\ x)^{\frac{1}{logx}}$
9. If u = $\log_e \sqrt{(x^2 + y^2 + z^2)}$ then prove that :
   $(x^2 + y^2 + z^2)\left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2}\right) = 1$.
10. If z = f(x, y) and $x = e^u – e^{-v}$, $y = e^{-u} + e^v$, then prove that :

$$\frac{\partial z}{\partial u} - \frac{\partial z}{\partial u} = x\frac{\partial z}{\partial u} - y\frac{\partial z}{\partial u}$$

11. If z is a homogeneous function of x and y of degree n, then prove that:

$$x\frac{\partial z}{\partial x} + y\frac{\partial z}{\partial y} = nz.$$

12. If $x = r \sin\theta \cos\varphi$, $y = r \sin\theta \sin\varphi$ and $z = r \cos\theta$, then show that :

$$\frac{\partial(x,y,z)}{\partial(r,\theta,\varphi)} = r^2 sin\theta$$

13. Evaluate :

$$\int \frac{2x+5}{\sqrt{x^2+3x+1}}$$

14. Show that :

$$\int_0^1 \frac{(1-4x+2x^2)}{\sqrt{2x-x^2}} dx = 0$$

15. Prove that :

$$\int sec^n x dx = \frac{sec^{n-2}x.\tan x}{n-2} + \frac{(n-2)}{(n-1)}\int sec^{n-2}x\, dx$$

and hence evaluate $\int \sec^6 x\, dx$.

16. Evaluate :

$$\int_0^{\pi} \frac{x\, dx}{a^2cos^2x + b^2sin^2x}$$

17. Show that $f(x) = \frac{1}{1-e^{\frac{1}{x}}}$, $x \neq 0$ has a simple discontinuity at x = 0

18. If y = sin (ax + b), then prove that:
$y_n = a^n \sin\left(ax + b + \frac{n\pi}{2}\right)$.

19. Expand log x in powers of (x – 1) upto the terms in x^2.

20. Find the radius of curvature of the curve s = c log sec ψ.

21. If z = sin xy and x = 2t + 5, y = $3t^2$, find $\frac{dz}{dt}$.

22. If u = 2x + 3y; v = 5x + 6y, then find $\frac{\partial(u,v)}{\partial(x,y)}$.

23. Evaluate :

$$\int_0^{\frac{\pi}{2}} \sin^5 x \cdot \cos^4 x \, dx$$

24. Find :

$$\int \frac{dx}{\sqrt{x^2-2x+5}}$$

25. If $\cos^{-1}\frac{y}{b} = \log\left(\frac{x}{n}\right)^n$, prove that

$$x^2 y_{n+2} + (2n+1)xy_{n+1} + 2n^2 y_n = 0.$$

26. Prove that

$$\log secx = \frac{1}{2}x^2 + \frac{1}{12}x^4 + \frac{1}{45}x^6 + \cdots$$

27. State and prove the all form of Taylor's Theorem.

28. If $u = \tan^{-1}\left(\frac{x^3+y^3}{x+y}\right)$, $x \neq y$ then show that

i. $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \sin 2u$

ii. $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2} = (1 - 4\sin^2 u)\sin 2u.$

29. If $v = r^m$, where $r^2 = x^2 + y^2 + z^2$, show that

$$\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2} + \frac{\partial^2 v}{\partial z^2} = m(m+1)r^{m-2}$$

30. Find the envelope of the lines $\frac{x}{a} + \frac{y}{b} = 1$, when the parameters a and b are connected by the relation $a + b = c$.

31. If the $x = r\sin\theta\cos\emptyset$, $y = r\sin\theta\sin\emptyset$. $z = r\cos\theta$,

Show that $\frac{\partial(x,y,z)}{\partial(r,\theta,\emptyset)} = r^2\sin\theta$

32. Verify $JJ' = 1$, if $x = u(1-v)$, $y = uv$.

33.Expand $\sin xy$ in power s of $(x-1)$ and $\left(y-\frac{\pi}{2}\right)$ upto second degree terms.

34.Divide 24 into three parts such that the continued product of the first, square of second and cube of the third is maximum.

35.Find the maximum and minimum distance of the point $(3,4,12)$ from the sphere $x^2+y^2+z^2=1$.

36.If $u_n=\int_0^{\frac{\pi}{2}}\theta\sin^n\theta\,d\theta$ and $n>1$, prove that

$u_n=\frac{1}{n^2}+\frac{n-1}{n}u_{n-2}$. Hence deduce that $u_5=\frac{149}{225}$.

37. Obtain a reduction formula for $\int x^m(\log x)^n\,dx$ and use it to evaluate $\int_0^1 x^4(\log x)^3\,dx$.

38. Evaluate $\int\frac{dx}{(x-1)^2(x-2)(x^2+4)}$.

39.If $I_n=\int_0^a(a^2-x^2)^n\,dx$ and $n>0$, prove that $I_n=\frac{2na^2}{2n+1}I_{n-1}$

SUBJECT: ELEMENTRY MATHEMATICS

1.Find real number x and y such that:

2x-3iy+4ix-2y-5-10i = (x+y+2) – (y-x+3)i

2.Prove:

a) $|Z_1+Z_1| \leq |Z_1|+|Z_2|$

b)arg z+arg z =0

3.Express each of the following complex number in polar form :

2+i

4.Prove DMT if n is positive or negative fraction then (cos nθ+isin nθ) is one of the value of$(\cos\theta+i\sin\theta)^n$,where θ€R .

5.Prove the following :

$(\sqrt{3}+i)^n+(\sqrt{3}-i)^n = 2^{n+1}\cos(\frac{n\prod}{6})$.

6.Find the value of$(32)^{1/5}$.

7.Find,all the(a)forth root (b)seventh root of unity .

8.Prove that if sinhw=z,then $w=\sinh^{-1}z=\log(z+\sqrt{z^2+1})$

9.If $\cosh(\alpha + i\beta)=\sin(x+iy)$

10.prove that :

$|e^z|=e^x$

11.prove that there cannot be any finit values of z such that

$e^z=0$.

12.Define,unit matrix,square matrix ,diagonal matrix ,skew symmentry matrix,with suitable example.

13.what is echelon matrix

14.Find the rank of the following matrices:

(i) $\begin{matrix} 2 & 1 & -1 \\ 0 & 3 & -2 \\ 2 & 4 & -3 \end{matrix}$

15. show that rank (AA')=rank A.

16.show that the rank of a skew symmentry matrix cannot be 1.

17.solve the system of equation :

5x+3y+7z=4, 3x+26y+2z=9, 7x+2y+11z=5

18.show that the equation :

X+2y-z=3, 3x-y+2z=1, 2x-2y+3z=2, x-y+z=-1 .

19.Find the eight value and associated eight vector for the following matrices :

$\begin{matrix} 1 & -2 \\ -5 & 4 \end{matrix}$

20. solve the equation $4x^2+20x^2-23x+6=0$,tow of its roots being equal.

21.solve the equation $8x^4-2x^2-27x^2+6x+9=0$,tow of its root being equal but opposite in sign.

22.solve the equation $2x^2-x^2-22x-24=0$,two of the roots being in the ratio 3:4 .

23.Find the condition that the roots of the equation $x^3-px^2+qx-r=0$ may be in A.P and hence solve $x^3-12x^2-39x-28=0$.

24.in an equation with rational coefficients,surd roots occure in pairs.

25.From the equation the equation of lowest dimention with rational coeffient ,one of whose roots is √3+i√2.

26.form the equation whose root are 0,0,2,2,-3,-3

28.solve the equation $x^4-2x^2+8x-3=0$.

29.The product of any m consecutive integers is divisible by m!.

30.show that ifa is an integer ,then 3 divides a^3-a.

31.let a and b be integer ,not both zero . then a and b are relatively prime if and only if there exist integers x and y such that 1=xa+yb.

32.if k.0, then gcd(ka,kb)=k gcd(a,b).

34.prove that the integer $53^{103}+103^{53}$ id divisible by 39.

35.Give an example to show that $a^2 \equiv b^2 \pmod n$ need not imply that $a \equiv b \pmod n$.

36.prove Chinese reminder therom.

37.find the integer having the reminders 1,2,5,5 when divided by 2,3,6,12 respectively.

38.prove Eulers formula.

39.find the valu of $(32)^{1/5}$.

40.prove that tan (iz)=I tanhz.

QUESTION BANK

BSC MATHEMATICS 6TH YEAR SEM VI

SUBJECT: LINEAR ALJEBRA

1)Define – Vector Spaces

2)Define – Linear Combination

3)Theorem – If S is a nonempty subset of a vector space V, them [S] = S if S is a subset of V.

4)Show that the ordered set {(1,1,2), (1,-1,1), (1,3,3), (-1,3,0), (1,0,1)} is Linearly dependent. Find the largest linearly independent subset of it.

5)Find whether the following subset of continues functions defined on the interval (0 ,00) are L.I. or L.D.

6)Prove that the vector (a,b) and (c,d) are L.D if ad = bc.

7)Find the coordinate vector of the vector (2,3,4,-1) of V4 relative to the standard basis for V4.

8) Prove that the vector (1,0,1), (1,1,0), and (-1,0,-1) are L.D.

9)If u, v and w are three linearly independent vectors of a vector space V , then show that u + v, v+ w and w+u are also L.I.

10)Theorem – In an n dimensional vector space V. any set of n linearly independent vector is a basis .

11)Define – Linear Transformation

12)Show that T: V3 → V3 define by T (x1,x2,x3) = (x1,x2,0) is a linear transformation

13)Show that T: V3→V1 define by T (x1,x2.x3) =$x1^2 + x2^2 + x3^2$ is not linear transformation

14)Let U and V be vector space over the field F and T: U→V be a linear map. Then

A

14)Let U and V be vector space over the field F and T: U→V be a linear map. Then

a)T(0) =0 b)T(-u)= -(u), ∀ u € U

15) A linear transformation T is completely determined by its values on the element of a basis. Precisely , if B ={ u_1, u_2, ……..,un} is a basis for U and v_1, v_2,…., v_n be n vectors (not necessarily distinct) in V the there exists a unique linear transformation T: U→V such that (u_i) = v_i , for *i* = 1,2,….,n .

16) If U and V are finite dimensional vector spaces of same dimention , then a linear map T: U→V is one-one iff T is onto .

17) Define – Inverse of Linear Transformation.

18) Show that the linear map T:V3→ V3 defined by

$T(x_1,x_2,x_3)= (x_1+x_2+x_3, x_2+x_3,x_3)$ is non-singular and find its inverse.

19) Prove that the linear map T:V3→V3 defined by $T(e_1)= e_1 + e_2$,

$T(e_2) =e_2+e_3$, $T(e_3)= e_1+e_2+e_3$ is non-singular and find its invers

20) Let T:V3→V3 be a linear map defined by.

21)Let T:v3→V3 and S: V3 → V3 be tow linear maps defined by.

22)Let a linear map T : V3 → V4 be defined by.

23)solve the equation T(u) = (1,1,0), where T ; V5 → V3 be a linear map defined by T(e1)=1/2f1, T(e2)=1/2f1,T(e3)=f2, T(e4)=f2, T(e5)=0

24)solve the linear differential equation dy/dx-xy/x2-1=x.

25)solve dy/dx+1/xsin2y=x2cos2y.

26)solve eydx=x(2xy+ey)y.

27)Determine the range kernel and pre-image of (1,2,3) for the linear transformation T: v3→v3 defind by T(e1)=e1-e2, T(e2)=e2, T(e3)=e1+e2-7e3 where, {e1,e2,e3} is the standard basis for V3.

28)solve dy/dx+1/x sin2y=x2cos2y.

29)solve eydx=x(2xy=ey)dy.

30)prove that A=$\begin{matrix}1 & 2\\ 0 & 1\end{matrix}$ is non-singular and find its inverse.

40) Using the Gram-schmidt orthogonalisation process, orthonormalise the l I subset {(1,1,1),(0,1,1),(0,0,1)} of V3.

41)if U is unitary matrix then |detU|=1.

INDRAPRATH NEW ARTS COMMERCE AND SCIENCE COLLEGE WARDHA

QUESTION BANK

BSC MATHEMATICS 6TH YEAR SEM VI

SUBJECT: LINEAR ALJEBRA

Define – Vector Spaces

Define – Linear Combination

Theorem – If S is a nonempty subset of a vector space V, them [S] = S if S is a subset of V.

Show that the ordered set {(1,1,2), (1,-1,1), (1,3,3), (-1,3,0), (1,0,1)} is Linearly dependent. Find the largest linearly independent subset of it.

Find whether the following subset of continues functions defined on the interval (0 ,00) are L.I. or L.D.

Prove that the vector (a,b) and (c,d) are L.D if ad = bc.

Find the coordinate vector of the vector (2,3,4,-1) of V4 relative to the standard basis for V4.

Prove that the vector (1,0,1), (1,1,0), and (-1,0,-1) are L.D.

If u, v and w are three linearly independent vectors of a vector space V , then show that u + v, v+ w and w+u are also L.I.

10)Theorem – In an n dimensional vector space V. any set of n linearly independent vector is a basis .

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Mathematics Paper II , Sem V (Metric space ,Boolean Algebra & Graph Theory)

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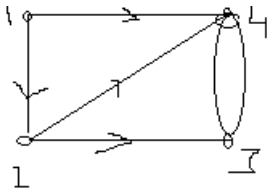
1) Prove that the set of even natural numbers is denumerable(or countable).
2) Every finite subset of a countable set A. Then A is also finite.
3) Prove that the product set $J \times J$ is countable, where J is the set of natural numbers.
4) Let X be a non-empty set and $d : X \times X \to R$ satisfies the condition:
   i) $d(x,y) = 0$ iff $x=y$ ii)$d(x, y) \leq d(x, z) + d(y, z)$, then show that d is a metric on X.
5) In any metric space X, the empty set ϕ and the full space X are open sets.
6) In any metric space X, each open sphere is an open set.
7) Every non-empty open set on the real line is the union of a countable disjoint class of open intervals.
8) In any metric space X, the empty set ϕ and the full space X are closed set.
9) Let X be a metric space. A subset F of X is closed if and only if its complement F' is open.
10) In any metric space X, each closed sphere is a closed set.
11) Every convergent sequence in a metric space is a Cauchy Sequence.
12) $\{x_n\}$ is a Cauchy Sequence of a real numbers iff $\{x_n\}$ is convergent in R.
13) Let Y be the subspace of a complete metric space X. Then Y is a complete iff Y ic closed.
14) Show that E = (0, 1) is not compact.
15) Compact subsets of metric spaces are closed.
16) Closed subsets of compact sets are compact.
17) If E is an infinite subsets of a compact set K, then E has a limit point in K.
18) Every K-cell is compact.
19) A set E in R is connected iff E is one of the interval.

20) (Weirstrass Theorem) Every bounded infinite subset of R^k has a limit point in R^k.
21) Show that the relation ' Divides' defined on the set of Natural Numbers n is a partial order relation .
22) Define join operation and Meet operation.
23) Does the lattice (S_{12}, D) is complimented Lattice?
24) Every Chain is a Distributive Lattice.
25) The direct product of any two distributive lattice is a distributive lattice.
26) In a distributive lattice , the compliment of an element is unique.
27) What is homomorphism?
28) Show that the lattice (S_n ,D) for n = 36 is isomorphic to direct product of lattice (S_n ,D) for n = 4 and 9.
29) State the Boolean identities and prove them.
30) Let A = { 3,4,5,6,7,8} and R = {(x – y) is divisible by 3} show that R is equivalence relation.
31) Show that a complete digraph with n nodes has the maximum numbers of edges it has is in n(n - 1), assuming loop.
32) In a simple digraph , the length of any elementary path is less than or equal to (n - 1) ,where n is the nymber of nodes in the graph . Similarly, the length of elementary does not exceed n.
33) Find the node-base for following diagraph.



34) In a simple diagraph G = < V, E> . Every node of the digraph lies in exactly one strong components.
35) Show the path matrix can be used to obtained strong component containing any particular node of the graph.

36) Show that the path matrix of a digraph can be used in determining whether certain procedure in a program are recursive.

37) For the digraph determine A', AA', and A'A . Unterpret the entries of the matrix A Λ A'.(A' is a transpose of A)

38) For any n × n Boolean matrix A, show that $(I + A)^{(2)} = (I + A) \Lambda (I + A) = I + A + A^{(2)}$. Where I is the n × n identity matrix and $A^{(2)} = A \Lambda A'$. show that for positive integer r $(I + A)^{(r)} = (I + A) \Lambda (I + A) \Lambda \ldots \Lambda (I + A) = I + A + A^{(2)} + \ldots + A^{(r)}$

39) In reference to Graph theory , define a path and a cycle.

40) Define a directed tree.

BACHERLOR OF SCIENCE SEMESTER 3

PAPER 2- MODERN ALGEBRA

1. Show that the set of all even integers (including zero) w.r.t addition is an infinite abelian group.
2. show that the set of all numbers cos Θ+ sin Θ from an infinite abelian group w.r.t ordinary multiplication ; where Θruns over all rational numbers.
3. Let G consist of the real number 1,-1 .show that is an abelian group of order 2 under the multiplication of real numbers.
4. Show that the set of cube roots of unity forms an abelian group w.r.t the usual multiplication of numbers.
5. Prove that the set G ={0,1,2,3,4} is a finite abelian group of orders 5 w.r.t addition modulo 5.
6. Let G be a group and a^{-1} b^{-1} ab=e¥ a,b£ G. prove that G is an abelian group.
7. Prove by giving an example that the union of subgroup is not necessarily a subgroup.
8. If S ={0,2,4} then show that (s+6) is a subgroup of the group(I6+6).
9. Every cyclic group is abelian.
10. The order of cyclic groups is same as the orders of its generator.
11. Show that there exist only two generators of any infinite cyclic group.

12. If H is finite subgroups of G ,then the numbers of element in a right (or left) coset of H is equal to the order of H.
13. If P is prime number and a is any integer ,then a^p=a mod p.
14. If H and K are two subgroup of a group G ,then prove that HK is subgroup of G if and only if HK=KH.
15. The subgroup N of a group G is normal subgroup of G if and only if every left coset of N in G is a right coset of N in G.
16. Prove that every subgroup of an abelian group is normal.
17. If H is a subgroup of G and N is normal subgroup of G , show that H ∩ N is normal subgroup of H.
18. If an abelian group G is simple ,then show that the order of G is prime .
19. Show that every quotient group of an abelian group is abelian but its converse is not true .
20. Let G ={ a,a^2 ,a^3 ,a^4,a^5,.....,a^{12}=e} be a cyclic group under multiplication .Let G ={a^2,a^4,a^6,.....,a^{12}} be its subgroups then prove that the mapping $a^n \rightarrow a^{2n}$ is a homomorphism of onto G.
21. Prove that every isomorphic image of cyclic group is cyclic.
22. The relation of isomorphism in the set of group is an equivalence relation.
23. The product of disjoint cycles is commutative.
24. Every permutation can be expressed as product (composite) of disjoint cycle .
25. Every permutation can be expressed as a product of transpositions .(2- cycles).
26. Write down all permutation on three symbols a,b,c. which of these are even?

27. Determine for what m an cycle is an even permutation?
28. Write the permutation in example 2 as the product of disjoint cycles.
29. Show that the set R of integer mod 7 under addition and multiplication mod 7 is a commutative ring with unity.
30. Let R be the set of integers mod 7 under addition and multiplication mod 7 is a commutative ring with unity .
31. Let R be the set of integers mod 6 under addition and multiplication mod 6 ,then R is commutative ring with unit element.
32. Show that every field is an integral domain.
33. If F is a field , then prove that its only ideals are (0) and F itself.
34. If U is an ideal of R ,then R/U is a ring .
35. Let R be a commutative ring with unit element whose only ideals are {0} and R itself .then R is a field.
36. Show by an example that extension ring of an integral domain need not essentially be an integral domain.
37. Show that ring of integral is Euclidean ring.
38. Every ideal in a Euclidean ring is principal ideal.
39. Prove that the necessary and sufficient condition that element a in Euclidean ring is unit is that d(a)=d(1).
40. If F is a field ,every ideal in F[x] is principal ideal ring .

Question Bank (2023-24)

Subject –Mathematics I (Sem IV)

(Real Analysis)

Unit-I

1) Define-Closed Interval ,Open Interval, Semi Closed and semi open interval.

2) Define- Bounded Set ,Unbounded Set,Bounded Above,Bounded Below.

3) Theorem- Let X be a non-empty subser of R which is bounded above.Then a real number M is the supremum of X if and only if

(a) $x \leq M$, for all $x \in X$

(b) For each real number **$\varepsilon > 0$,there is a real number** $x \in X$ such that $x > M - \varepsilon$.

4) Let $X<Y \subseteq R$ be non empty bounded sets and $\alpha \in R$. Then

a)$\sup(X+Y)=\text{Sup } X + \text{SupY}$

b)$\text{Inf}(X+Y)=\text{Inf } X + \text{InfY}$

5) Define Neighbourhoods. Prove that an open interval is a nbd of each of its pair.

6) Prove that a finite set is not a nbd of any of its points.

7) Define Open set.The union of an arbitrary collection of open set.

8) Theorem- Every Infinite bounded subset of R has a limit point.

9) Derived set of a set X is closed.

Unit-II

1) Theorem on Convergent Sequence.
2) Every convergent sequence has a unique limit.
3) Show that the sequence <xn>,Where Xn $=\frac{1}{2n}$ converges to 0.
4) Define-Operation on sequence, constant sequence.
5) Algebraic properties of convergent sequence.
6) Theorem-sandwich Theorem.
7) Theorem-A Monotonic increasing sequence is convergent, if and only if it is bounded.
8) Theorem on Cauchy sequence.

Unit-III

1) Theorem –Necessary and sufficient condition of a series
2) The Series $1+\frac{1}{2}+\frac{1}{3}+\ldots\ldots\ldots\ldots\ldots+\frac{1}{n}$ is not convergent.
3) The series $1+\frac{1}{3}+\frac{1}{5}+\ldots\ldots\ldots\ldots\ldots+\frac{1}{2n-1}+\ldots\ldots\ldots\ldots\ldots$is not convergent.
4) Theorem-If $\sum$ xn and $\sum yn$ be two given positive term series such that $\frac{Xn}{Yn}$ =l ≠0,where l is finite, then the two series $\sum$ Xn & $\sum$Yn are either both convergent or divrergent.
5) Theorem- Cauchy's Root Test.

6) Theorem- D'Alembert's Ratio Test.

Unit-IV

1) Properties of Integeal equation.
2) If M and m be the supremum and infinite of a bounded function f on [a,b]then m(b-a)≤ L (p,f) ≤U(p,f) ≤M (b-a).
3) Theorem (Darboux's theorem)
4) A bounded monotonic function f defined on [a,b]is integrable on[a,b].
5) Mean –Value Theorem for integral.

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BSC MATHEMATICS 1ST YR SEM II

SUBJECT: SOLID GEOMETREY

1) Define– Distance Formula
2) Define-Projection
3) Explain: Equation of a sphere in Different forms.
4) Theorem- To prove that the equation of a sphere described on the segment joining the point (X1, Y1 ,Z1)and (X2 ,Y2 ,Z2)as a diameter is (X-X1)(X-X2)+(Y-Y1)(Y-Y2)+(Z-Z1)(Z-Z2)=0
5) Obtain the equation of the sphere described on the join of the points A(2,-3,4),B(-5,6,-7)as diameter.
6) Find the equation of the sphere which passes through the four points (2,0,4)(-2,3,1) (0,-4,2).
7) A sphere of radius k passes through the origin and meets the axes in A,B,C .Prove that the centroid of the triangle ABC lies on the sphere9(x^2 +y^2+z^2
8) A Variable plane passes through a fixed point (a,b,c) cuts the co-ordinates axes in the points A,B,C.
9) Find the equation of the sphere which passes through the points (1,-3,4)(1,-5,2)(1,-3,0) and whose centre lies on the plane x+y+z=0
10) Find the equation of the sphere which passes through the points (1, -3,4),(1,-5,2)and (1,-3,0) and whose centre lies on the plane x+y+z=0.
11) Find the equation of the sphere which passes through the points (1,0,0),(0,1,0)and (0,0,1) and radius as small possible.
12) A point moves so that the sum of the square of its distances from the six faces of a cube is constant;show that its locus is a sphere.
13) Find the equation of the sphere which passes through the four points (2,0,1)(5,3,1) (6,-4,2).
14) Obtain the equation of the sphere described on the join of the points A(3,-3,4),B(-5,9,-7)as diameter.
15) Find the equation of the sphere which passes through the points (9,-3,4)(5,-5,2)(4-3,0) and whose centre lies on the plane x+y+z=0
16) Theorem- A plane section of a sphere is a circle.
17) Intersection of Two sphere.
18) The locus of the sphere of int6ersection of two sphere is a circle.
19) Find the equation of the circle circumscribing the triangle formed by the three point (a,0,0),(0,b,0),(0,0,c).obtain also the coordinates of the centre of the circle.
20) Show that the points(5,0,-2)(2,-6,0)(7,-3,8)(4,-9,6) are concyclic.
21) Define-Cone
22) Find the equation of right circular cone whose vertex is at the origin ,whose axis is the line x=1/2 y=1/3 z and which has semi-vertical angle 30^0
23) Fijnd the equation of right circular cone generated by revolving a straight line 5y +2z=10,x=0 about the Z-axis.
24) Find the equation of the right circular cylinder of radius 2 whose axis pass through the point (1,0,3)and has d.c's proportional to (2,3,1).

25) Define-Linear Differential equation.
26) Bernoulli's Differential Equation.
27) Solve xy''-y=3x2
28) Solve xy"+y'=4x

29) Find the equation of right circular cone whose vertex is (2,-3,5), axis makes equle angle with the co-ordinate axes and semi-vertical angle is 30◦.

30)Find the equation of the right circular cylinder of radius 2 whose axis pass through the point (1,0,3) and has d.c's proportional to (2,3,1).

31) Find the equation of the right circular cylinder of radius 4, whose axis passes through the origin and makes equle angles with the coordinate axes.

32) Exact Differential Equation.

33) The General Solution of the Homogeneous Equation.

34) Theorem: Linear Differential Equation.

35) Find y2 and the general solution of the equation y"-y=0 from the given solution y1=ex.

36)The equation xy"+3y'=0 has the obvious solution y1=1. Find y2 and the general solution.

37) Find the general solution of y"-f(x)y' +[f(x)-1]y=0.

38) Verify that one solution of xy"- (2x+1)y' + (x+1)y=0 is given by y1=ex, and find the general solution.

39) Find general solution of y"+y'-6y=0.

40) Find a particular solution of y"+y=cosec x.

1. A particle moves along the curve $x = t^3 + l$, $y = t^2$, $z = 2t^2 + 5$ at any time t. Find the components of velocity and acceleration at t — 1 in the direction $2\hat{I} + j + 3k$
2. Find the directional derivative of $\emptyset i = x^2y^2 + yz^2$ at the point (2, -l, 1) in the direction of the vector +2 j — 2k
3. Prove that div grad $r^a = n(n + l)r^{n-2}$.
4. Find the total work done in moving a particle in a force field given by = 2xyi + 3zj + 6xk along the curve $x = t^2 + t$, $y = t$, $z = t^3$ from t = O to t = 1
5. Evaluate $\int_0^c \int_x^c \frac{xdydx}{\sqrt{x^2+y^2}}$, c is a positive constant, by changing the order of Integration.
6. Evaluate $\int_0^a \int_0^{\sqrt{a^2-x^2}} y^2\sqrt{x^2+y^2}\,dxdy$ by changing Into polar coordinates.
7. Evaluate $\iint (x2 + y2)dxdy$ by changing into polar coordinates, where R is the region $(x2 + y2) \leq 1$
8. Evaluate the surface Integral $\iint (yz\hat{I} + zxj + xyk)$ o dS where S is the surface of the sphere $x^2 + y^2 + z^2 = I$ in the first octant.
9. Evaluate $\iiint (x2 + y2 + z2)\,dxdydz$, where R denotes the region bounded by x = O, y = O, z = 0 and x + y + z = a.
10. If $\bar{A}$= (2y + 3)i + xzj + (yz —x)k, then evaluate Ä o di along the straight lines from(O, O, O) to (O, O, 1), then to (O, 1, l) and then to (2, l, 1).
11. Find the work done in moving particle in a force field $F = 3x^2 i + (2xz — y)$ j + zk along the straight line from (O, O, O) to (2, 1, 3). 6
12. Evaluate $\iint F$ o dS, where $F = (x + y^2)i — 2xj + yzk$ and S is the surface of the plane x + y + z = 3, which is located in the first octant.
13. Find the volume of the region common to the intersecting cylinder $x^2 + y^2 = a^2$ and $x^2 + z^2 = a^2$

14. Consider a simple closed curve C in a simply-connected region with appropriate properties, Prove that M dx + N dy = O if and only if $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$ everywhere in the region.

15. Verity Green's theorem in the plane for $\oint(3x2 - 8y2)\,dx + (4y - 6xy)\,dy$, where C is theboundary of the region defined by y = $\sqrt{x}$ and y = x^2.

16. Verify the divergence theorem for A = 4xi — $2y^2$ j + z^2 k taken over the region bounded by$x^2 + y^2 + z^2 = 4$, z = 0 and z = 3.

17. Evaluate $\iint \bar{\nabla} \, x \, \bar{A} \, o \, \hat{n} \, dS$ where A =$((x^2 + y - 4)i - 2y^2 j + z^2 k)$ and S is the surface of the hemisphere $x^2 + y^2 + z^2 = 16$ above xy-plane,

18. Verify Stoke's theorem for the vector field defined by = $(x^2 - y^2)$ i + 2xyj in the rectangular region in the xy plane bounded by lines x = O, x = a, y = 0, y = b.

19. Evaluate FoñdS by using divergence theorem, where F =4xzi — y^2 j + yzk and S is the surface of the cube enclosed by x = O, y = O, z = O, x = l, y = 1, z = 1

20. Evaluate$\oint[(xy - y^2)dx + (x^2 - y)dy]$, by using Green's theorem in a plane, where C is the closed curve of the region bounded by y = x and $y = x^2$.

21. Test the convergence of .

(i) $\int_0^1 \frac{\cos x}{x^2}\,dx$

22. Prove that

(i) $\overline{n+1} = n!$, n = 1, 2, 3, ...

23. Show that Beta function B(m, n) = $\frac{\lceil m \lceil n}{\lceil m+n}$; m, n > 0 .

24. Show that $\bar{f}$ = (x^2 — yz)i + (y^2 — zx)] + (z^2 — xy)k is irrotational.

25. Evaluate $\int_1^2 \int_0^{y/2} ydydx$.

26. If H =curl A, then show that $\iint$ H o ñdS = 0 for any closed surface S by using divergence theorem.

27. $\oint_C xdy - ydx$.

28. Evaluate $\int_0^\infty \frac{x^3}{(1+x)^9} dx$

29. Evaluate

30. ..

31. Evaluate $\int_0^1 x^4\,(l - x)^3\,dx$.

32. A particle moves so that its position vector is given by r = cosωti + sinωtj where ω is a constant. Show that

(a)The velocity $\vec{v}$ of the particle is perpendicular to F.

(b)The acceleration is directed towards the origin and has magnitude proportional to the distance from the origin and

(c) $\bar{r}\ x\ \bar{v} = \bar{a}$, a is constant vector.

33. If $\vec{v} = \bar{\omega}$ x $\bar{r}$, prove that $\bar{\omega}$=$\frac{1}{2}$curl $\vec{v}$, where $\bar{\omega}$ is a constant vector.

34. Find the directional derivative of $x^2y^2z^2$ at the point (1, 1, -1) in the direction of the tangent to the curve x = et, y = Sin 2t + l, z = 1- cost at t = 0

35. Evaluate $\iint_{\sqrt{x}}^{1} e^{\frac{x}{y}}$ dydx by changing the order of integration.

36. If $\varphi = 2xz^4 - x^2y$, find $\bar{\nabla}\varphi$ at (2, —2, —l).

37. Verify that the vector $\bar{A} = 3y^4z^2\,i + 4x^3z^2\,j - 3x^2y^2\,k$ is solenoidal.

38. Evaluate $\iint_0^2 (x + 2)\,dxdy$

39. Evaluate $\int_1^2 \bar{F}dt$, where $\bar{F}$ =3i + $(t^3 + 4t^7)$j + tk

40. Determine limits for $\iiint x2\ y\ dV$, where V is the closed region bounded by the planes x + y + z = 4, x = 0, y = 0, z = 0.

41. Write the statement of Gauss Divergence Theorem.

42. Suppose$\bar{H}$= curl $\bar{A}$. Prove that $\iint \bar{H}\cdot\bar{n}\ dS = 0$ for any closed surface S.

Question Bank

Subject : Mathematics Paper II sem VI (Numerical Method)

Unit I

1)Find the root, correct to the three decimal places & laying between 2&3 of the equation X^3-2x^2-5 By using Bisection Method.

2)Find the root, correct to the three decimal places & laying between 2&3 of the equation X^3-2x^2-5 By using regula falsi Method.

3) By Using Newton Raphson Method to find a real root of x sin x +cos x =0 near x =π iteration upto 4 decimal places.

4) Given $\frac{dy}{dx} = 1+y^2$ where y(0)=0. Find y(0.2) &y(0.4) by Runge kutta fourth order formula.

5) Find the root, correct to the three decimal places & laying between 2&3 of the equation X^3- x-1 By using Bisection Method.

6) Find the root, correct to the three decimal places & laying between 2&3 of the equation X^3- x-1 By using falsi position Method.

7) Find the rootof the equation X^3- 2x-5=0 By using secant Method.

8) Find the rootof the equation X^3- x-1=0 By using secant Method.

Unit II

1) 3)Using Newton Forward differential formula .find the sum sn=1^3 +2^3 +3^3+……

2) Find the cubic polynomial which takes the following values y(1)=24, y(3)=120,y(5)=336,y(7)=720.Hence ,or otherwise obtain the value of y(8)

3) Value of x(in degree)and sin x are given in following table.

X in degree	Sin x
15	0.2588190
20	0.3420201
25	0.4226183
30	0.5
35	0.5735764
40	0.6427876

Determine the value of sin 38^0 by using Newton's Backward Difference Formula.

4) The table below gives the value of tan x for $0.10 \leq x \leq 0.30$

X	Y= tan x
0.10	0.1003
0.15	0.1511
0.20	0.027
0.25	0.2553
0.30	0.3093

find tan (0.12) , tan (0.30)

5) For the following table,find the value of $e^{1.17}$ .using Gauss forward formula.

X	Y= e^x
1.00	2.7183
1.05	2.8577
1.10	3.0042
1.15	3.1582
1.20	3.3201
1.25	3.4903
1.30	3.6693

6) The following table gives the value of e^x for a certain equidistant values of x and find the value of e^x for x=0.644. using stirling and Bessel's Formula.

x	$Y=e^x$
0.61	1.840431
0.62	1.858928
0.63	1.877610
0.64	1.896481
0.65	1.915541
0.66	1.934792
0.67	1.954237

7)Certain corresponding value of x and log x are (300,2.4771),(304,2.4829)&(307,2.4871).Find log 301.

Unit III

1) from the following table of values of x & y .obtain $\frac{dy}{dx}$ and $\frac{d2y}{dx2}$ for x =1,2

x	y
1.0	2.7183
1.2	3.3201
1.4	4.0552
1.6	4.9530
1.8	6.0496
2.0	7.3891
2.2	9.0250

2)Calculate 1st and 2nd derivatives of the function tabulated in the previous table at the point x=2.2 and also $\frac{dy}{dx}$ at x=2.0

x	y
1.0	2.7183
1.2	3.3201
1.4	4.0552
1.6	4.9530
1.8	6.0496
2.0	7.3891
2.2	9.0250

3)Find $\frac{dy}{dx}$ and $\frac{d2y}{dx2}$ at x=1.6 for the tabulated function

x	y
1.0	2.7183
1.2	3.3201
1.4	4.0552
1.6	4.9530
1.8	6.0496
2.0	7.3891
2.2	9.0250

4)Find the From the given table,the area bounded.by the curve and the x-axis from x= 7.47 to x=7.52

x	F(x)
7.47	1.93
7.48	1.95
7.49	1.98
7.50	2.01
7.51	2.03
7.52	2.06

5)Evaluate I = $\int_0^1 \frac{1}{1+x}$ dx . correct to three decimal placed saved by trapezoidal and simpson's rule with h = 0.5 ,0.25 , 0.125 resp.

6)use the euler maclaurin formula to prove, $\sum x^2 = \frac{n(n+1)(n+2)}{6}$

Unit IV

1)Given that differential equation ,y''- xy'-y = 0. With the condition y(0)=1 & y'(0) = 0 use Taylor's series method,to determine the value of y(0.1) correct to the seven decimal places.

2)Use of Picards method to obtain $y^{(1)}$ and $y^{(2)}$ .solve the equation $y'=x+y^2$,subject to the constraint y=1 when x=0 &find $y^{(2)}$.

3)Determine the value of y when x=0.1 given that y(0)=1 & $y'=x^2 + y^2$ by modified Euler's method take h=0.05

4) Given, $\frac{dy}{dx}$ $=1+y^2$ where,y(0) =0.find y(0.2)and y(0.4) by Runge kutta fourth order formula.

Subject: Mathematics Paper II Mathematical Method

1) Find the radius of convergent for the following power series:
   a)$\sum_{n=0}^{\infty} n!\, x$n
2) For the differential equation y'+y =1, find a power series solution of the form ∑ an xn and try to recognize the resulting series as the expansion of a familiar function. Also ,verify your conclusion by solving the equation directly.
3) Theorem- Let x_0 be an ordinary point of the differential equation: y" +P(x)y' +Q (x)y=0
4) Find the general solution of y"+y=0 in terms of power series in x.can you express this solution by means of elementary function?
5) Verify that the solution y"+ y'-xy =0 has a three term recursion formula,and find its series solution y1(x) &y2(x) such that (a) y1(0) =1 (b)y1'(0)=0
6) Find the indicial equation and its roots for the differential equation x^3 y''+(cos 2x -1)y' +2xy
7) For the following differential equation , locate and classify its singular points on the x-axis:
8) Bessel's equation of order zero x^2y''+xy'+x2y=0.Show that its indicial equation has only one root,and corresponding Frobenius series solution is y =$\sum_{n=0}^{\infty}(-1)$n/2n(n!) x2n.
9) Legendre's function of the first kind(or Legendre's polynomial of degree n).
10) Show that all the roots of Pn(x)=0 are distinct.
11) Show that all the roots of Pn(x)=0 are not distinct must be wrong.
12) Show that Pn(1)=1 and Pn(-x)=(-1)nPn(x).Hence or otherwise deduce that Pn(-1)=(-1)n.
13) Determine the polynomials Pn(x)for n=0,1,2,3,4,5
14) Find series of Legendre's polynomials for x^2
15) Recurrence formula for the Legendre's polynomial Pn(x) (2n+1)xpn=(n=1)Pn+1+ nPn-1.
16) nPn= xP'n-P'n-1

17) Orthogonality of Legendre's polynpmial.
18) Recurrence Formula for the Bessel's function jn(x)
19) For the differential equation y'+y =1, find a power series solution of the form ∑ an xn and try to recognize the resulting series as the expansion of a familiar function. Also ,verify your conclusion by solving the equation directly.
20) Prove that Jn(x)=0 has no repeated roots except at x=0
21) Sectional or piecewise continuity.
22) Existence of Laplace Transform of f(t).
23) Laplace Transform of Some Elementry Function. L{1}=1/s ,s>0
24) Properties of Laplace Transforms. A)Linearity Properties B)First Shifting .
25) Laplace Transform of Derivative of f(t).
26) Laplace Transform of Integral of f(t).
27) Laplace Transform of f(t)/t (Division by t)
28) Evaluate L{t2 cos2t}
29) Find the Laplace transform of the following functions t sin at.
30) Evaluation of Integrals.
31) Unit step function.
32) Laplace Transform of Unit step function
33) Find the Laplace transform t2 u (t-3)
34) Define : Periodic Function.
35) Laplace transform of Bessel Function j0(t) and j1(t).
36) Inverse Laplace Transforms.
37) Properties of Inverse Laplace Transforms.
38) Linearity Properties.
39) Explain Second shifting Property.
40) Find the Inverse Laplace transform of the following function.a)s/s^2

Mahila Vikas Sanstha's
INDRAPRASTHA NEW ARTS COMMERCE & SCIENCE COLLEGE, AT POST NALWADI, DIST. WARDHA (M.S.)
Accredited 'B' by NAAC

Approved by government of Maharashtra
Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
Recognised by U.G.C New Delhi under section 2 (f) & 12 (b) of UGC act 1956

M.Sc. (Computer Science)

Multimedia Technologies

Unit :- 1

1. Give overview of multimedia software tools. 8

2. Explain different types of video signals in multimedia techniques. 8

3. Explain different file format used in multimedia. 8

4.State and explain any four multimedia software tools.

5. Explain digitization of sound in detail. 8

6.What is GIF File? Explain its format. 8

7. Explain with example multimedia and hypermedia in detail.

8.Explain in detail quantization and transmission of audio. 8

9. What is multimedia? explain its features.8

10. How image data is represented? Explain different image formats. 8

11. Explain the concept of digital video. Describe different types of video signals.

12. Explain quantization and transmission of audio.8

Unit :- 2

1.Explain:

(i) Exception

(ii) Interface

2.What is action script? Explain object oriented action script. 10

3.Write notes on: 10

(i) Action Script class

(ii) Action Script subclass.

4. Explain in detail the contents of the class body. 10

5.Explain the features of Action Script. 8

6.Explain complex data types supported by core classes in Action Script, each with an example

7. Explain compile time and runtime type checking with an example. 8

8. What is an interface? Explain its use with an example. 8

9.Write short notes on:

(i) abstraction

(ii) inheritance8

10. Describe different datatypes and type checking used in Action Script with example. 8

11.What is Action Script? Explain different features of Action Script. 8

12. Write a note on ‘Packages in Action Script II’. 8

Unit :- 3

1. Explain OOP application framework in detail. 8

2. Explain any one lossless compression algorithm in detail. 8

3.Explain Wavelet-Based Coding lossy compression.

4. Explain the process of quantization in multimedia. 8

5. Which components are used with Action Script for Movie Clip subclasses? Explain in brief.

6. Explain variable length coding algorithm. 8

7.Write notes on:

(a) Wavelet Based Coding

(b) Quantization. 8

8. Explain Embedded zerotree of wavelet co-efficient set partitioning in hierarchical trees (SPIHT).sion algorithm in detail. 8

9.What is Wavelet-Based and Transform coding ? Explain. 10

10.Explain Embedded zero tree in hierarchical trees. 10

11.What is multimedia data compression? Explain lossless compression algorithm.

12. Explain Application framework components with Action Script Movie Clip subclass. 10

Unit :- 4

1. Explain how video compression is developed based on motion compensation. 10

2.What is multimedia network ? Describe transforming multimedia over IP. 10

3. Explain different Basic Audio compression techniques. 10

4. Write notes on :

(i) MPEG –4

(ii) MOD. 10

5.Explain linear search and hierarchical search for motion vectors. 8

6.Write a note on issues of buffer management. 8

7. Explain the parameters on which the quality of multimedia transmission depends. 8

8. Describe in brief DMIF in MPEG-4. 8

9.Write note on search for motion vectors. 8

10.Explain transport of MPEG-4 in brief. 8

11. Describe different multimedia network application. 8

12.How quality of Multimedia Data transmission is maintained?

Department of Computer Science
Subject:- Operating System
Class:- B.Sc III Sem
Question Bank

UNIT I

1.Explain the structure of operating system. List the characteristics of modern operating system.

2. What is thread ? Explain multithreading in detail.

3. What is CPU scheduling ? Explain round robin scheduling in detail.

4.Define process. Explain the different states of process.

5. Draw structure of operating system and explain ?

List different categories of threads . explain multithreading with suitable diagram.

6. Discuss priority scheduling algorithm with suitable example.

7. Explain role of Long term and short term scheduler.

8. Discuss characteristics of modern operating system.

9. Explain FCFS CPU Scheduling algorithm with suitable example

10.Explain :— (i) User level thread (ii) Kernel level thread.

11.What is scheduler and dispatcher ? Explain role of medium term scheduler.

12. Explain process. List states of process with example.

13.What is CPU Scheduling ? Explain Round Robin Scheduling with suitable example.

14.List and explain characteristics of modern operating system.

15.Consider the following set of processes that arrive at time 0, the length of the CPU burst time given in milliseconds.

Process	Burst time (in milliseconds)

P1	**5**
P2	**24**
P3	**16**
P4	**10**
P5	**3**

Calculate average turnaround time, average response time and average waiting time by FCFS Scheduling.

16.Write short notes on :— (1) Deterministic modelling (2) Queuing analysis. 17.Explain resource allocation graph with example.

UNIT II

1. **Explain deadlock prevention.**
2. **List and explain various methods for deadlock recovery**
3. **Explain concept of segmentation with paging.**
4. **What is Swapping ? Explain swap in and swap out process with well labelled diagram.**
5. **Explain the method of multiple partition memory management.**
6. **Write short notes on :— (1) Relocation (2) Protection.**
7. **Write short notes on :— (1) Digital Signature. (2) Biometric authentication.**
8. **List the various file allocation methods and explain any two.**
9. **Explain scan disk scheduling algorithm with example**
10. **What is Buffering ? Give types of buffering. Explain any two.**
11. **Draw life cycle of thread.**
12. **Explain circular wait condition with example.Explain logical and physical address space.**
13. **Write short note on Record blocking.**
14. **List multiple partition memory management schemes and explain any one with example.**

UNIT III

1. **Explain segmentation with paging.**
2. **Write a note on dynamic loading and dynamic linking.**
3. **Explain :**
   - **(i) Relocation**
   - **(ii) Protection.**
4. **Explain single, double and circular buffering.**
5. **Write short notes on :**
   - **(i) Digital signature**
   - **(ii) Cryptography.**
6. **What is RAID ? Explain its different levels.**

UNIT IV

1. **List different file allocation methods and explain any two.**
2. **Explain short term on medium term scheduler.**
3. **Explain Hold and Wait condition with diagram**
4. **Write short note on shared pages.**
5. **Write short note on physical identification.**
6. **Explain following methods for recovery from Dead lock.**
   - **(i) Process termination. (ii) Resource preemption.**
7. **Write short note on Performance analysis.**
8. **Explain following circumstances in which deadlock may occur. (i) Mutual exclusion (ii) Hold and wait.**
9. **Explain Banker's Algorithm for Dead lock avoidance**
10. **Explain Dynamic Partitions memory management scheme with suitable example.**
11. **Explain segmentation with paging considering suitable example.**
12. **Explain Scan disk scheduling algorithm with**

QUESTION BANK

BACHELOR OF COMMERCE (COMPUTER APPLICATION) (BCCA)

Course: BCCA – III (Semester – V) **Subject: VB.NET**

Part - A

(Each question carries **Two** marks)

UNIT – I

1. What is .Net Framework?
2. What is MSIL?
3. What do you mean by executing code?
4. What do you mean by console application?
5. What is variable?
6. What is module?
7. What is IDE?
8. List out the components of visual basic.net IDE.
9. Define data type.
10. What is comment?
11. What is whitespace?
12. What do you mean by iteration?
13. What do you mean by Operator?
14. What are control flow statements?
15. What is method?

Part - A

(Each question carries **Two** marks)

UNIT – II

1. What is an array?
2. How to declare an array in VB.Net?
3. What is enumeration?
4. What is Structure?
5. What is collection?
6. What o you mean by array list?
7. What is event?
8. What is form?
9. What is use of property window?
10. What is the use of label control?
11. What is the use of button control?
12. Difference between check box and radio button control?
13. What is the use of color dialog box?
14. What is use of solution Explorer Window?
15. What is the use of save dialog box?

Part - A

(Each question carries **Two** marks)

UNIT – III

1. Define menu.
2. Write any three features of menu.
3. What are context menus?
4. What do you mean by debugging?
5. Define syntax error. Give an example.
6. What do you mean by exception?
7. Write the syntax of try – catch block of VB.Net.
8. What is object oriented programming?
9. What is class?
10. What is object?
11. Define Constructor.
12. Define Inheritance.
13. What are the advantages of inheritance?
14. What is namespace?
15. What is the use of import statement in VB.Net?

Part - A

(Each question carries **Two** marks)

UNIT – IV

1. Define database.
2. What is table?
3. What do you mean by Query?
4. What is DataSet?
5. What is the purpose of OleDbConnection?
6. What is the purpose of OleDbCommand?
7. What do you mean by data binding?
8. What is ADO.Net?
9. What is the purpose of SqlConnection Class?
10. What is the purpose of SqlDataAdapter class?
11. What is deployment?
12. What is XCOPY Deployment?
13. What are the uses of Bootstrap Loader?
14. What do you mean by Private Assemblies?
15. What do you mean by 'deploying a Web Applications'?

Part - B

(Each question carries **Three** marks)

UNIT – I

1. What is the purpose of Common Language Specification?
2. What is Common Type System?
3. What is Common Language Runtime?
4. What are the advantages of VB.Net?
5. Write down the steps to install VB.Net.
6. Differentiate Single-Precision Floating-Point Numbers and double-Precision Floating-Point Numbers with example.
7. What is Select - Case Statement? Give an example.
8. What do you mean by Case Else Statement? Give an example.
9. How to declare a method? Give its syntax and example.
10. Write down the syntax and example of If statement in VB.Net.
11. Write down the syntax and example of Do - Loop in VB.Net.
12. Write down the syntax and example of Do Until - Loop in VB.Net.
13. What do you mean by nested loop?
14. Give an example of infinite loop.

Part - B

(Each question carries **Three** marks)

UNIT – II

1. How to declare an array? Give an example.
2. What do you mean by ReDim Keyword in VB.Net?
3. What is constant? Give an example.
4. How to define structure in VB.Net? Give an example.
5. Write down any three controls in VB.Net.
6. Write down the purpose of any three events of VB.Net.
7. What is Single Document Interface?
8. What is Multiple Document Interface?
9. What are enumerations?
10. What is hash table?
11. What is lookup table?
12. Write down any three properties of Text Box in VB.Net.
13. Write the syntax and example of Message Box in VB.Net.
14. How to change the font of Text Box using Font Dialog Control?

Part - B

(Each question carries **Three** marks)

UNIT – III

1. How to create menu bar in VB.Net?
2. How to create context menu in VB.Net?
3. How to create tool bar in VB.Net?
4. Give an example of logical errors in VB.Net.
5. How to set Break Points in VB.Net?
6. What do you mean by 'Debugging Using the Command Window'?
7. What do you mean by 'Debugging Using the Watch Window'?
8. How to create an object in VB.Net? Give an example.
9. How to create a class in VB.Net?
10. What is method overriding?
11. What do you mean by base class and derived class?
12. How to create a constructor in VB.Net?
13. Write down any two types of error in VB.Net.
14. What do you mean by reusability?
15. Write down the syntax and example of Try – Catch statement.

Part - B

(Each question carries **Three** marks)

UNIT – IV

1. Explain Select Statement in SQL.
2. What is the purpose of OleDbDataAdapter class?
3. What is the purpose of DataView in VB.Net?
4. What is the meaning of DataGrid Control?
5. What is the purpose of DataSource Property?
6. Write down the syntax and example of Binding Controls.
7. What do you mean by No Touch Deployment?
8. How to creating a setup application for Paint?
9. What do you mean by Shared Assemblies?
10. What do you mean by 'Deploying Desktop Applications'?
11. Write any three Data Access Components in VB.Net.
12. Write a note on System.Data namespace.

Part - C

(Each question carries **Five** marks)

UNIT – I

1. Explain .Net framework classes in detail.
2. How to execute an application in VB.Net? Explain.
3. Write a note on common language runtime.
4. Explain various data types supported by VB.Net.
5. Why use methods? Explain with an example.
6. Explain If- Else statement with example.
7. Explain nested If statement with example.
8. Explain For … Next Loop with its syntax and example.
9. Explain For Each … Next Loop with its syntax and example.
10. Explain While … End While Loop with its syntax and example.

Part - C

(Each question carries **Five** marks)

UNIT – II

1. Write a note on 'Passing Arrays as Parameters'.
2. What is enumeration? Explain with an example.
3. What is structure? Explain with an example.
4. What is constant? Explain various constant with example in VB.net.
5. Explain ArrayList with example in VB.Net.
6. What do you mean by dynamic array? Explain with suitable example.
7. Write down the steps to build a simple windows application in VB.Net.
8. Explain the properties and methods of FontDialogBox control.
9. Explain the properties and methods of OpenDialogBox control.
10. Explain the properties and methods of PrintDialogBox control.

Part - C

(Each question carries **Five** marks)

UNIT – III

1. How to set Check Marks and Radiochecks in menu bar in VB.Net.
2. Create a context menu and perform action on mouse click in VB.Net.
3. Explain various types of error in VB.Net.
4. Write a note on 'Debugging with the Locals Window'.
5. What do you mean by encapsulation? Explain.
6. What is class? Explain with a suitable example.
7. Explain constructor in details.
8. Differentiate menu and context menu in VB.Net.
9. Write a note on 'Reusability'.
10. Explain debugging techniques in detail.

Part - C

(Each question carries **Five** marks)

UNIT – IV

1. Explain any two data access components in VB.Net.
2. Explain ADO.NET Data Namespaces in detail.
3. What is the purpose of ExecuteNonQuery Method? Explain.
4. How to set SelectCommand to a Stored Procedure in VB.Net? Explain.
5. Explain different Binding Controls in detail.
6. Explain No Touch Deployment and XCOPY Deployment in detail.
7. Write down the steps to create a Visual Studio .NET Setup Application.
8. Write a note on Assemblies.
9. Explain the Core of Deployment Using a Bootstrap Loader.
10. Write a note on OlDbCommand and OleDbDataReader in VB.Net.

Part - C

(Each question carries **Ten** marks)

UNIT – I

1. Differentiate DOS programming and Windows programming in detail.
2. Explain .Net Framework architecture with suitable diagram.
3. Write short notes on –
    a. Common Language Specification
    b. Common Type System
4. Write short notes on –
    a. MSIL
    b. Common Language Runtime
5. Explain Visual Basic .NET IDE in detail.
6. Explain various control flow statements in details.
7. Explain various looping statements available in VB.Net with their syntax and example.

Part - C

(Each question carries **Ten** marks)

UNIT – II

1. What is structure? Write its syntax and example. Differentiate structure and array in VB.Net.
2. Explain Dynamic Array and ArrayList with suitable example.
3. Explain MessageBox Dialog box in detail.
4. How to build Lookup Tables with Hashtable in VB.Net? Explain.
5. Write down the steps to create the status bar and tool bar in VB.Net.
6. Write down the steps to create and clear the edit box in VB.Net.
7. Explain the properties and methods of following –
    a. FontDialogBox Control
    b. PaintDialogBox Control
8. Explain the properties and methods of following –
    a. OpenDialogBox Control
    b. SaveDialogBox Control

Part - C

(Each question carries **Ten** marks)

UNIT – III

1. Explain menu and context menu in details.
2. What is an error? Explain various types of error available in VB.Net.
3. Explain debugging in detail.
4. What is inheritance? Write a program in VB.Net to demonstrate the concept of inheritance.
5. Write a Windows application using Context Menu to Cut, Copy, Paste Text using Rich Text Box Control.
6. Explain .net framework classes in details.

Part - C

(Each question carries **Ten** marks)

UNIT – IV

1. What is database? Explain SQL statement in detail.
2. Explain all the data access components in detail.
3. Explain ADO.Net in detail.
4. Explain properties and methods of DataSet Class.
5. Explain the process of deployment in detail.
6. Write a note on-
    a. Sql Command
    b. sqlDataAdapter
    c. sqldatasetclass
    d. dataview
7. Write a windows application to demonstrate the use of Data Grid View in VB.Net.
8. Write a note on
    a. Data Source Property
    b. Data member Property

QUESTION BANK

BACHELOR OF COMMERCE (COMPUTER APPLICATION) (BCCA)

Course: BCCA – III (Semester – V) **Subject: Tally**

Part - A

(Each question carries **Two** marks)

IT – I

1. Write the procedure to open Tally ERP.9.
2. How to shut a company?
3. What is Tally ERP.9?
4. List any two features of Tally ERP.9.
5. List the components of Tally ERP.9 window.
6. What do you mean by 'Data Synchronization' in Tally ERP.9?
7. How to open the gateway of Tally Screen?
8. What are the short cut keys to display the company features and to display the configuration menu in Tally ERP.9?
9. How to open calculator in Tally ERP.9?
10. What do you mean by stock group?
11. What do you mean by stock category?
12. What do you mean by stock item?
13. What is compound unit?
14. What do you mean by godown?
15. Define 'Unit of Measure'.

Part - B

(Each question carries **Three** marks)

UNIT – I

1. Write down the major enhancement introduced in Tally ERP.9.
2. Write a short note concurrent multi-lingual capability feature of Tally ERP.9.
3. How to select a company in Tally ERP.9.
4. Write down the steps to display stock group.
5. Write down the steps to display multiple stock group.
6. Write down the steps to display a single stock category.
7. Write down the steps to alter a single stock category.
8. Write down the steps to display a single stock item.
9. Write down the steps to alter a single stock item.
10. Write down the steps to display a multiple stock item.
11. Write down the steps to alter a multiple stock item.
12. How to create a simple unit in Tally ERP.9? How to activate godown option in Tally ERP.9?
13. How to display a single godown in Tally ERP.9?
14. How to display unit of measure in Tally ERP.9?

Part - C

(Each question carries **Five** marks)

UNIT – I

1. Explain the features of Tally.
2. How to delete a company in Tally ERP.9? Explain.
3. Explain different buttons are available when Gateway of Tally screen appears.
4. Explain product information bar appears at the bottom of Tally ERP.9 Window.
5. Explain status bar appears at the bottom of Tally ERP.9 Window.
6. How to alter a company in Tally ERP.9?
7. Write down the steps to create Stock Group with screen.
8. Write down the steps to alter a stock group.
9. Write down the steps to alter a multiple stock group.
10. Write down the steps to create Stock Categories with screen.
11. How to create a compound unit in Tally ERP.9?
12. How to alter a godown in Tally ERP.9.

Part - C

(Each question carries **Ten** marks)

UNIT – I

1. Write down the steps to create company in Tally ERP.9.
2. Explain installation procedure of Tally ERP.9.
3. Explain components of Tally ERP.9 window in detail.
4. Write down the steps to create multiple Stock Group with screen.
5. Write down the steps to create multiple Stock Categories with screen.
6. Write down the steps to create single Stock items with screen.
7. Write down the steps to create multiple Stock items with screen.
8. Write down the steps to create unit with screen.
9. Write down the steps to create single godowns with screen.
10. Write down the steps to create multiple godowns with screen.

Part - A

(Each question carries **Two** marks)

UNIT – II

1. Define Group.
2. What is Ledger?
3. What is Voucher?
4. Write down the steps to display Single Group in Tally ERP.9.
5. Write down the steps to display Single Ledger in Tally ERP.9.
6. Write a short note on Purchase Order in Tally ERP.9.
7. Write a short note on Sales Order in Tally ERP.9.
8. Write a short note on Invoice in Tally ERP.9.
9. Write down the steps to display balance sheet in Detailed format
10. Write down the steps to display the weekly Profit & Loss Account.
11. Write down the steps to display Trail Balance in Detailed format
12. Write down the steps to display Day Book Report for a particular Voucher.

Part - B

(Each question carries **Three** marks)

UNIT – II

1. How to alter a single Group in Tally ERP.9.
2. How to alter a single Ledger in Tally ERP.9.
3. Write down the steps to display a Voucher in Tally ERP.9.
4. Write down the steps to alter a voucher in Tally ERP.9.
5. Write down the steps to alter a purchase Order in Tally ERP.9.
6. Write down the steps to delete a Purchase Order in Tally ERP.9.
7. Write down the steps to alter a Sales Order in Tally ERP.9.
8. Write down the steps to delete a Sales Order in Tally ERP.9.
9. Explain displaying the ledger-wise closing balance in a Trial Balance Report Tally ERP.9.
10. Write down the steps to alter a column in stock summary report Tally ERP.9.
11. Write down the steps to delete a column from the stock summary report Tally ERP.9.
12. Write down the steps to delete a column from a Balance Sheet in Tally ERP.9.

Part - C

(Each question carries **Five** marks)

UNIT – II

1. Explain the steps to create a single Group in Tally ERP.9.
2. Explain the steps to create a Single Ledger in Tally ERP.9.
3. Explain the Setting of Accounting Features in Tally ERP.9.
4. Explain the setting of Inventory features in Tally ERP.9.
5. Explain the setting of Statutory & Taxation Features in Tally ERP.9.
6. Explain how to alter a voucher in Tally ERP.9.
7. How to Configure Balance Sheet in Tally ERP.9.
8. How to display Profit & Loss Account in a Different Currency in Tally ERP.9.
9. Explain the steps to view the stock category summary in Tally ERP.9.
10. Explain the steps of display a trial balance Report for a Particular Date in Tally ERP.9.
11. Explain Configuring a Day Book Report in Tally ERP.9.

Part - C

(Each question carries **Ten** marks)

UNIT – II

1. Explain the steps to create a primary group in TallyERP.9.
2. Explain the Steps to create a Multiple Groups in Tally ERP.9.
3. Explain the steps to create a Multiple Ledger in Tally ERP.9.
4. Explain the steps to create a voucher type in Tally ERP.9.
5. Explain the steps to create a purchase orders in Tally ERP.9.
6. Explain the steps to create sales orders in Tally ERP.9.
7. Explain the Purchase Invoice entry with example in tally ERP.9.
8. Explain the Sales Invoice entry with example in tally ERP.9.
9. Explain the steps to print the invoice/ Voucher in Tally ERP.9.
10. Explain how to configure the Profit & Loss Account in Tally ERP.9.

Part - A

(Each question carries **Two** marks)

UNIT – III

1. What is payroll?
2. What is pay slip?
3. What is payroll information?
4. What is payroll voucher?
5. What is payroll report?
6. Steps to create tax ledger
7. Write down the steps to print TDS challan.
8. Write down the steps to print TCS Report.
9. What is Tax?
10. What is TDS?
11. What is TCS?
12. What is VAT?
13. What is Indian Tax Structure?
14. What is TDS Challan?
15. What is VAT report?
16. What is Service Tax?
17. Write the steps to create tax ledger.
18. How to create TDS voucher?
19. How to create TCS voucher?
20. How to create VAT ledger?

Part - B

(Each question carries **Three** marks)

UNIT – III

1. What do you mean by payroll voucher?
2. How to print pay sheet in Tally?
3. What is statement of payroll report?
4. How to enable payroll in Tally ERP 9?
5. Draw the chart showing payroll report
6. What do you mean by pay slip?
7. How to activate service Tax in Tally?
8. Write down the types of VAT in Tally.
9. What is VAT report?
10. How to display service Tax reports in Tally?
11. How to enable VAT in Tally?
12. How to activate TDS in Tally ERP?
13. How to configure VAT in Tally ERP?
14. How to configure TCS in Tally?
15. What is the procedure to view the TDS report?
16. Differentiate between VAT and TDS.
17. How print TDS challan in Tally ERP.9?
18. How to access VAT report in Tally?
19. How to access service tax report in Tally?
20. Write short note on TCS report in Tally.

Part - C

(Each question carries **Five** marks)

UNIT – III

1. What is Payroll? Explain its features.
2. Explain Payroll reports in detail.
3. Explain the needs of Payroll in Tally.ERP9.
4. Explain the needs of Salary Report.
5. Explain the Importance of Pay Sheet.
6. How to create Employee details in Payroll info? Explain its creation screen.
7. Explain Statutory and Taxation in detail.
8. Explain the procedure to create Payroll Voucher.
9. Explain the procedure to display Payroll Report with diagram.
10. Explain working of VAT in Tally.ERP9.
11. Explain working of TDS in Tally.ERP9.
12. What is Service Tax? Explain in detail.

Part - C

(Each question carries **Ten** marks)

UNIT – III

1. What is Service Tax? Explain Service Tax reports in detail.
2. What is TDS? What are the benefits of TDS to Government?
3. What is VAT Report? Explain Different types of VAT Reports.
4. Demonstrate VAT transactions with any 05 entries.
5. Demonstrate TDS transactions with any 05 entries.
6. Explain the Features of TCS Report.
7. Explain the procedure to create VAT reports in Tally ERP.9.
8. What is Tax? Explain the structure of Indian Tax in detail.
9. What is TDS? Write down the procedure to deduct tax in Tally ERP.9 in detail.
10. What is TDS challan? Write down the steps in detail.

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Part - A

(Each question carries **Two** marks)

UNIT – IV

1. Write down the steps to take back-up in Tally ERP 9.
2. What are the Steps to restore data in Tally ERP.9.
3. What is the Procedure of Migrating data in from Tally 7.2 to Tally ERP 9.
4. List various security levels for company.
5. Write down the Steps to create security control in Tally ERP 9.0
6. Write the Procedures to connect the company to Tally.NET
7. Write down any two configuring features in Tally .NET
8. What is server login?
9. Write any two Tally.NET Features.
10. Define remote user.

Part - B

(Each question carries **Three** marks)

UNIT – IV

1. Write down the step of back up in Tally ERP 9.
2. What do you mean by restoring of data?
3. What is the use of E-mail in tally ERP 9.
4. Define Tally.Net in Tally ERP.
5. Write any four configuring features in Tally.Net.
6. What do you mean by security in tally ERP 9?
7. Write down the steps to create security levels in Tally ERP 9.
8. What is security controls?
9. What do you mean by logging as a remote user?
10. Write short notes on Tally.Net server.

Part - C

(Each question carries **Five** marks)

NIT – IV

1. Explain restore option in tally ERP.9.
2. Describe the term 'split company data'.
3. Explain connect company option in tally ERP.9.
4. How will you delete company from tally ERP.9?
5. Write procedure to create security control in tally ERP.9.
6. How will you set list of users for security control.
7. Explain tally.net features.
8. Explain assigning of username & password for company.
9. Explain any 5 inventory books available in tally ERP.9.

Part - C

(Each question carries **Ten** marks)

UNIT – IV

1. How to take back-up and restore the data in Tally.ERP9? Explain.
2. Explain Horizontal button bar of Tally.ERP9.
3. How to migrate data from Tally7.2 to Tally.ERP9? Explain with diagram.
4. How to configure the Tally.NET in Tally.ERP9? Explain in detail.
5. What is Security Level? How to create security levels in Tally.ERP9?
6. What is Security Control? Write a procedure to create security control in Tally.ERP9.
7. Explain the following terms—(1) Assigning securities levels (ii) Creating security controls.

Department of Computer Science
Class: BSc VI Sem
Subject : CC(Paper I)
Question Bank

Unit I

1. **Explain working of compiler with reference to its phases.**
2. **Write notes on the following :**
   - **(i) Compiler**
   - **(ii) Interpreter**
   - **(iii) Assembler**
   - **(iv) Translator.**
3. **What is Code Optimization ? Explain with proper example.**
4. **Explain the function of "Book keeping" in compilation process.**
5. **Write a note on "Need of Compiler".**
6. **Explain intermediate code generation phase with example.**
7. **Write short note on Error Handling.**
8. **What is Addressing Mode ? Explain any three addressing modes with example.**
9. **Draw phase diagram of compilation process and give purpose of each block.**
10. **Why are translators needed ?**
11. **Explain the process of Error detection and reporting. Give its importance.**
12. **What are the different phases of Compilers ? Give its diagrammatic representation and explain**
13. **in brief the functions of each phrase.**
14. **Explain intermediate code generation with suitable example.**
15. **What do you mean by symbol table ? How is it managed in the compilation process ?**

Unit II

1. **What is parameter transmission ? Explain the following :**
   - **(i) Call-by-value**
   - **(ii) Call-by-reference.**
2. **Discuss salient features of good programming language.**
3. **Explain basic data structures in brief.**
4. **What are the types of statement ? Explain simple and compound statement with example.**
5. **Explain hierarchical structure of programming language.**
6. **Draw and explain hierarchical structure of programming languages.**
7. **How is static storage allocation and dynamic storage allocation managed in HLL ? Explain.**
8. **Explain the following semantic specifications :**
   - **(i) Interpretive**
   - **(ii) Translation**
   - **(iii) Axiomatic definition**
   - **(iv) Extensible definition**
   - **(v) Mathematical semantics.**
9. **List types of arrays. Explain any two.**
10. **List tokens and give one example of each.**
11. **Give definition of programming language. What is syntax and symantics of high level language ?**
12. **What do you mean by lexical analysis ? Explain alphabets and tokens with suitable example.**
13. **How are record structures defined in higher level language ? Explain with example.**
14. **Explain the following memory allocation :**

(i) Stack allocation

(ii) Heap allocation.

Unit III

1. **What is Finite Automata ? Give the transition function and language recognized by the NFA with example.**

2. **Explain various rules of "Thomson Construction "for converting regular expression to NFA.**
3. **Show whether the grammar is ambiguous or not :**
4. **S → aSbS | bSaS |∈ 5**
5. **Convert the regular expression (a|b)*a into NFA using Thomson construction rules.**
6. **What is input buffering ? Explain.**
7. **Explain role of Lexical Analyzer.**
8. **Draw Parse tree for the following expression :– id + id * id.**
9. **Write a short note on context free grammar**
10. **What is Regular Expression ?**
11. **Explain the role of lexical analysis in the process of high level language compilation.**
12. **Explain the following terms in grammar :**
    - **(i) Terminals**
    - **(ii) Start symbols**
    - **(iii) Nonterminals**
    - **(iv) Production.**
13. **Draw the transition diagram for constant and explain it with example.**

Unit IV

1. **Write a note on "Register allocation and assignment".**

2. **Explain operator precedence parser with suitable example.**
3. **What is a DAG ? Construct a DAG for the following expression :**
   a + [b * (b – c)] + [(b – c) * d]
4. **Explain shift reduce parsing with suitable example.**
5. **What do you mean by Handle Prunning ? Explain.**
6. **Write short note on Loop Optimization.**
7. **Explain simple code generator.**
8. **Explain DAG representation of basic blocks.**
9. **What is Top Down parsing ? Explain with example.**
10. **What are the capabilities of a symbol table ?**
11. **Explain top-down passing for the following grammar :**
    S → cAD
    A → ab/a.
12. **What are the contents of symbol table ? Give the structure of symbol table.**
13. **Discuss Top-Down passing with example.**

Department of Computer Science
Class: BSc V Sem
Subject : DBMS(Paper II)
Question Bank

Unit I

1. **Define DBMS. What are the objectives of DBMS ?**
2. **Explain relational database model in DBMS.**
3. **What are the issues involved in handling traditional file processing system ?**
4. **Write a note on 'database users' in DBMS.**
5. **What are the advantages of DBMS ?**
6. **Give classification of Data Models and explain in brief.**
7. **Explain network data model with example and discuss advantages and disadvantages ofthis model.**
8. **Explain different problems associated with traditional file processing system.**
9. **Draw three level architecture of DBMS and explain.**
10. **Explain Data Migration.**
11. **What are the different problems in traditional file processing system ?**
12. **Explain the Network data model with suitable example.**
13. **Explain the different components of database management system.**
14. **Explain the three level architecture of DBMS**

Unit II

1. **What do you mean by weak and strong entity set in DBMS ? Explain with example.**
2. **Draw an E-R diagram for hospital system.**
3. **What is generalization and specialization in DBMS ? Explain**
4. **Explain data mapping with suitable example.**
5. **Explain super key, candidate key and primary key with suitable example.**
6. **Define attribute. Explain :**
   - **I. Simple and composite attribute**
   - **II. Single valued and multivalued**
   - **III. Null attribute**
   - **IV. Derived attribute.**
7. **List symbols used in E-R diagram and explain their meaning. Give one example of**
8. **E-R diagram.**

9. **Explain Relationship giving suitable example.**
10. **Explain Data mappings.**
11. **Draw an E-R diagram for Hospital System.**
12. **Explain Aggregation with suitable example.**

Unit III

1. **Explain natural join operation with suitable example.**
2. **What are aggregate functions ? Explain with examples.**
    a. **SAILOR (sid, sname, rating, age)**
    b. **BOAT (bid, bname, color)**
    c. **RES_BOAT (sid, bid, date)**
    d. **Answer the query in relational algebra to find all sailors who have rating of at least 8 or reserved boat 103.**
3. **Explain union and intersection operation with example.**
4. **Explain in brief set intersection operation.**
5. **Explain following operations with suitable example :**
    a. **Union**
    b. **Set difference.**
6. **Consider following relation :**
    a. **NSS_UNIT(stu_name, volunteer_no)**
    b. **NCC_UNIT(stu_name, cadet_no)**
7. **Answer following query in relational algebra :**
    a. **Find names of all students who are members of both NSS_UNIT and NCC_UNIT.**
8. **Explain left, right and full outer join operation with example.**
9. **Consider following relation :**
    a. **loan(branch_name, loan_no, loan_amt).**
    b. **Construct queries in relational algebra for following :**
    c. **Find all tuples with branch name "XYZ".**
    d. **Find all tuples with loan_amt more than 2 lac.**
    e. **Find all tuples with branch name "PQR" and loan_amt more than 5 lac.**
    f. **Find branch_name of loan_no "LOOA58".**
    g. **Find loan_no pertaining to "MNO" branch.**
10. **Explain projection operation with suitable example.**
11. **Explain the Division operation with suitable example.**
12. **Consider the following relations**
    Depositor (Cust_name, acct_no)

Borrower (Cust_name, Loan_no)

13. **Answer the following query in relational algebra : Find the names of all bank customers who have either an account or a loan or both.**
14. **Explain the Cartesian product operation with suitable example.**
15. **Consider the following relations :**
    Borrower (Cust_name, Loan_no)
    Loan (Branch_name, Loan_no, Amount)
    Answer the following query in relational algebra. Find the names of all customers who have a loan at Nagpur Branch.

Unit IV

1. **What is Functional Dependency ? Explain full and partial functional dependency with example.**
2. **Define normalization. Define BCNF with suitable example.**
3. **Explain the role of functional dependency in the process of normalization.**
4. **Explain the fourth normal form giving suitable example.**
5. **Explain transitive functional dependency.**
6. **Explain 2NF. Discuss problems arising in three basic operations_insert, delete and update when relation is in 2NF.**
7. **Explain partial functional dependency and transitive functional dependency with example.**
8. **Write advantages of representing data in normalized form. Also draw successive levels of normal forms.**
9. **Identify the functional dependencies in the following table :—**

   J K L
   x 1 2
   x 1 3
   y 1 4
   y 1 3
   z 2 5
   P 4 7 5

10. **Explain with example Second Normal Form (2NF).**
11. **Explain BCNF with suitable example.**
12. **Explain the multivalued dependency.**

Department of Computer Science
Subject : Data Structure(Paper I)
Class: Bsc III Sem
Question Bank

Unit I

1. What is linked list ? Give array representation of linked list.
2. Write an algorithm to count the number of nodes in the single linked list.
3. Write an algorithm to insert node at the begining of double linked list.
4. Write an algorithm to delete the last node of single linked list.
5. Define double linked list.
6. Write an algorithm to insert an element ITEM after element KEY in the double linked list.
7. Explain the representation of linked list in memory.
8. Write an algorithm to delete the front element of linked list.
9. Write an algorithm to add the two polynomials represented as a linked list.
10. Define circular linked list.
11. Write short notes on :
12. Garbage collection
13. Overflow and underflow.
14. Write an algorithm to delete the first node from a linked list.
15. What is a header list ? Explain one way and two way circular header list.
16. What is two way linked list ? Write an algorithm to insert an element at the beginning of two way linked list.
17. What are the advantages of double linked list over single linked list ?
18. What is linked list ? Explain its memory representation.
19. Write an algorithm to insert a node at the beginning of linked list.
20. What is a doubly linked list ? Write an algorithm to delete the last node from a doubly linked list.
21. Write an algorithm to delete the front node of a single linked list.
22. Differentiate between single linked list and two way linked list.

Unit II

1. **Write an algorithm for Tower of Hanoi problem.**
2. **What is Stack ? Explain Push Operation and Pop operation used in Stack.**
3. **Explain quick sort method with suitable example.**
4. **Convert the following expression into prefix and postfix notation :**
   (i) a^x+b^y/a^x-b^y (ii) ax4 + bx3 + cx2 + dx + e.
5. **Solve the Tower (3, BEG, AUX, END).**
6. **Explain the quick sort method with suitable example.**
7. **What is a stack ? Explain its memory representation. Write an algorithm to insert element in stack.**
8. **Write an algorithm for translating the infix expression into postfix notation.**
9. **Explain the overflow and underflow condition in array representation of stack.**
10. **What is a Stack ? Explain push and pop operations on stack.**
11. **Write an algorithm to convert an infix expression into postfix.**
12. **Explain quick sort with an example.**
13. **Write an algorithm for evaluation of a postfix expression.**
14. **Convert the following infix expression into prefix :**
    A | (B – D) / (E – F) ^ G
15. **Explain the stack and representation of a stack.**
16. **Write the algorithms for push and pop operations on stack.**
17. **Convert the following expression to prefix and postfix :**
    A + (B ∗ D/E) ∗ (F + G/H) ∗ K. 5
18. **Write a recursive algorithm for Tower of Hanoi problem.**
19. **Explain recursion with an example.**

Unit III

1. **Write an algorithm for Insertion sort method.**
2. **Define Priority Queue. Explain the array representation of priority queue in memory.**
3. **Explain Merge sort method with suitable example.**
4. **What is Queue ? Write a procedure to insert element in queue.**
5. **Explain memory representation of Queue.**
6. **Write on algorithm to delete the element from circular queue.**
7. **Explain insertion sort method with a suitable example.**
8. **Write an algorithm for selection sort method.**
9. **What is priority queue ? Explain the array representation of priority queue in memory.**
10. **Discuss the complexity of selection sort method.**
11. **What is a priority queue ? Give its memory representation.**
12. **Write an algorithm to delete an element from a linear queue.**
13. **Write a short note on hashing techniques.**
14. **Write a short note on deque.**
15. **Write short notes on :**
    - **(i) Deque**
    - **(ii) Priority queue.**
16. **Write an algorithm for inserting a node in a circular queue.**
17. **Explain with an example the selection sort technique.**
18. **What is hashing ? Explain various hashing functions.**
19. **Write a short note on complexity of algorithm.**

Unit IV

1. **Write an algorithm for Depth-First Search (DFS) method.**
2. **What is tree ? Explain representation of Binary tree in memory.**
3. **What is graph ? Explain representation of Graph in memory.**
4. **Given :**
   Inorder : n1, n2, n3, n4, n5, n6, n7, n8, n9
   Postorder : n1, n3, n5, n4, n2, n8, n7, n9, n6
5. **Draw the tree.**
6. **Explain Binary Search tree.**
7. **Write an algorithm for Depth first search of graph.**
8. **What is graph ? Give its memory representation as an array and linked list.**
9. **Write an algorithm for the inorder traversal of a binary tree.**
10. **Explain the array representation of a graph.**
11. **Explain the method for breadth first search in a graph.**
12. **What is a heap ? How will you insert an element in a heap ?**
13. **Write an algorithm for pre order traversal of a binary tree.**
14. **Explain the linked representation of a graph.**
15. **Explain the steps for depth first search in a graph.**
16. **Explain Heap Sort method with suitable example.**

Department of Computer Science
Class : B.Sc II Sem
Subject : Oops
Question Bank

Unit I

1. **What is inline member function ? How will you make a member function defined outside the class as inline ?**
2. **Write a syntax for accessing class members and write a program in C++ which shows member function defined inside the body of the student class.**
3. **Explain access specifiers in C++ with example.**
4. **What is static data members ? Write access rules for static data members and static member functions.**
5. **Explain class and object with example.**
6. **What are classes and objects ? Describe syntax for declaring a class with suitable example.**
7. **Explain features of OOP's.**
8. **Write a program to implement class :**
   - **(I) Data member**
     - **(i) Name of cricket player**
     - **(ii) Score in last two matches.**
   - **(II) Member function**
     - **(i) To assign initial values**
     - **(ii) To compute total and average score**
     - **(iii) To display data. 5**
9. **What is the purpose of static data member ? Explain with example.**
10. **Explain private and public specifier.**
11. **What are the different characteristics of object oriented programming ? Explain.**
12. **Write a program to create a class student. Data members are roll no., name m1, m2 and m3.**
13. **Write member function to compute total and percentage.**
14. **What are inline functions ? Explain with example outside member functions as inline.**

UNIT 2

1. **What is constructor ? Explain the parameterized constructor with a suitable example.**
2. **What is copy constructor ? Explain with example.**
3. **Write a program in C++ which shows the use of destructor.**
4. **What is operator overloading ? Write a program in C++ to overload the unary operator '__ _'.**
5. **Differentiate between constructor and destructor.**
6. **Explain the need of copy constructor with example.**
7. **How is constructor invoked ? Explain usage of constructor giving suitable example.**
8. **Explain default constructor with example.**
9. **Explain unary operator overloading with example.**
10. **What are Constructors and Destructors ? Explain it with suitable example.**
11. **Explain with example parameterised constructors.**
12. **What is Overloading ? State different rules for operator overloading.**
13. **Write short note on copy constructor. Explain it with suitable example.**

UNIT 3

1. **What are dynamic objects ? What is the difference between dynamic memory allocation and dynamic objects ?**
2. **What is 'this' pointer ? Write a program demonstrating the use of 'this' pointer.**
3. **What is inheritance ? Explain single inheritance with a suitable example.**
4. **Write a program in C++ for multilevel inheritance.**
5. **Draw a labelled diagram for hybrid inheritance and hierarchical inheritance.**
6. **What is inheritance ? List its types. Explain single inheritance with example.**
7. **Write a program to illustrate the use of this pointer and explain.**
8. **What is an abstract class ? How will you define it ? Give an example.**
9. **What is derived class ? Explain giving suitable example.**
10. **Explain multilevel inheritance.**
11. **What is Dynamic Object ? Explain new and delete operators.**
12. **Explain abstract class with suitable example.**
13. **What is Inheritance ? Explain multiple inheritance with suitable example.**
14. **What is array of object ? Write a program to demonstrate array of object.**

UNIT 4

1. **What are virtual functions ? Give its advantages and write rules for it.**
2. **What is Exception ? List all exceptions with its purpose.**
3. **Explain Abstract class with example.**
4. **Write a program in C++ to handle division by zero exception.**
5. **Explain handling uncaught exceptions.**
6. **What meaning does it convey :**
   - **(i) Hit the exception**
   - **(ii) Throw the exception ?**
7. **Draw and explain exception handling model.**
8. **Write a short note on fault tolerant design techniques.**
9. **What are virtual functions ? State rules for virtual functions.**
10. **How will you handle an uncaught exception ?**
11. **Write difference between Virtual and pure virtual function.**
12. **Explain in detail fault tolerant design techniques.**
13. **What is Exception ? Write a program to handle uncaught exception.**
14. **Write a program in C++ to create a class emp and member functions addemp( ) and**
15. **displayemp( ). Further extend your program to display only those employees whose salary is greater then 25000.**

QUESTION BANK

BACHELOR OF COMMERCE (COMPUTER APPLICATION) (BCCA)

Course: BCCA – II (Semester – III) **Subject: Business Economics**

Part - A

(Each question carries **Two** marks)

UNIT – I

1. Define Economics.
2. What is an Economy?
3. How Market mechanism solves the basic problems of an economy?
4. What do you mean by Demand side of Market?
5. What is consumer surplus?
6. What is market equilibrium?
7. Define Business Economics.
8. What is Demand?
9. Define Cardinal Utility.
10. What is Marginal Utility?
11. What is Cross-Elasticity of demand?
12. What do you mean by income elasticity of demand?
13. Define elasticity of demand.
14. What is Supply side of market?
15. What is Consumer Demand?
16. How market demand is derived from individual demand?
17. Explain Ordinal Utility.
18. Define Price Elasticity of Demand.
19. Write short note on Demand Forecasting.
20. Write short note on Forecasting Methods.

QUESTION BANK

BACHELOR OF COMMERCE (COMPUTER APPLICATION) (BCCA)

Course: BCCA – II (Semester – III) **Subject: Business Economics**

Part - A

(Each question carries **Two** marks)

UNIT – II

1. Define production function.
2. State the various factors of production.
3. What is Short Run law of Production?
4. What do you mean by Long Run Production?
5. Define total cost.
6. Define fixed cost.
7. What is variable cost?
8. What are marketing economies of scale?
9. Define Market.
10. Define Industry.
11. Define Perfect competition?
12. State the objectives of business firms.
13. Write short note on Modern theory of cost.
14. What is Cost Analysis?
15. Define cost function.
16. What is pricing strategy?
17. Define competitiveness.
18. Define the Firm.
19. How price is determined in a perfectly competitive market?
20. Write short note on long run supply curve.

Part - A

(Each question carries **Two** marks)

UNIT – III

1. What is an Oligopoly?
2. Define Duopoly.
3. What is Monopoly?
4. What is monopolistic competition?
5. What is selling costs?
6. Write any two features of selling costs.
7. What is a kinked demand curve?
8. What is a collusive oligopoly?
9. What is profit?
10. What is Short-Run equilibrium?
11. What is a Cartel?
12. What is Long-Run equilibrium?
13. Define Capacity Utilization.
14. Define Multiplant Monopoly.
15. Write a short note on Monopoly Theory.
16. Write a short note on Revenue Curve under monopoly.
17. Define Theory of monopolistic Competition.
18. What is excess capacity in monopolistic competition?

Part - A

(Each question carries **Two** marks)

UNIT – IV

1. Define rent.
2. What is quasi-rent?
3. What do you mean by interest?
4. Define dynamic wage differentials.
5. Define static wage differentials.
6. What is extensive Cultivation?
7. Define Intensive Cultivation?
8. Define the term transfer earnings.
9. What is profit as a reward of innovations Theory?
10. Define Economic Rent.
11. Why the demand of a factor is a derived demand?
12. What is Factor Prize?
13. Define Factor Market.
14. What is the theory of Rent?
15. What is Interest Rate?
16. Define Wage Determination.
17. What is theory of profit?
18. Define Pure Profit.
19. What is Factor Demand?
20. Define pure Profit.

Part - B

(Each question carries **Three** marks)

UNIT – I

1. What is the nature of business economics?
2. What is the scope of business economics?
3. State some economic concepts applied in business analysis.
4. What are characteristics of Free Enterprise Economy?
5. What is the role of government in the economy?
6. State the assumptions of law of demand.
7. State the exceptions of law of demand.
8. What is highly elastic demand? Give one example.
9. What are the prerequisites of good demand forecasting?
10. What is the meaning of demand forecasting?
11. How the consumer surplus is measured?
12. What is Individual Demand Curve?
13. Write down the concept of law of demand.
14. What is the basis of Consumer Demand?
15. What is highly inelastic demand? Give one example.
16. Write a short note on Ordinal Approach to Consumer Demand.
17. What is Free Enterprise Economy?
18. What are different kinds of Economic Systems?
19. Write a short note on Business Analysis.

Part - B

(Each question carries **Three** marks)

UNIT – II

1. What is Economic region of Production?
2. What is short run cost?
3. What do you mean by incremental and sunk cots?
4. What are explicit and implicit costs?
5. What is market structure?
6. What are the components of market structure?
7. What are the long run costs?
8. State the characteristics of perfect competition.
9. What are external diseconomies?
10. What do you mean by Profit?
11. Why economies of scale are important?
12. What is perfect competition market structure?
13. What are the factors that influence pricing decisions?
14. Write a short note on Law of Production.
15. What is Production Function?
16. What is reasonable profit target?
17. How the Profit acts as control measure?
18. Define the Law Of Returns To Scale Through Production Function.
19. What is Perfect Competition?
20. What is the difference between a firm and industry?

Part - B

(Each question carries **Three** marks)

UNIT – III

1. What are the characteristics of monopoly market?
2. What are the drawbacks of Chamberlin's theory of monopolistic competition?
3. What are the distinct characteristics of an oligopoly?
4. Describe any three features of monopolistic competition
5. What is Sweezy's Kinked-Demand Curve?
6. Differentiate profit and economic profit.
7. Write a short note on A Classical Model of Duopoly.
8. What are sources of monopoly?
9. How does a monopoly determine price and output?
10. What are the common misconceptions about monopoly?
11. Write a short note on Capacity utilization under monopoly.
12. How the Price-Output is determined in a multi-plant Monopoly?
13. Differentiate Monopoly and Perfect Competition.Write short note on Equilibrium of Multiplant monopoly
14. What is monopoly power?
15. What is Selling Cost?

Part - B

(Each question carries **Three** marks)

UNIT – IV

1. What is the marginal productivity of factor demand?
2. Define quasi-rent.
3. Define profit.
4. State the criticism on Clark's theory of Profit.
5. What is Economic Rent?
6. Criticize the Keynesian theory of interest.
7. Write a short note on Individual Labor Supply.
8. Write a short note on wage determination under Competitive Labor Market.
9. What are the different types of Rent?
10. State different Classical Theories of Interest.
11. What are the features of Factor Supply?
12. Define Economic Profit.
13. What is Modern Theory of Interest?
14. How the economic rent is calculated?
15. What is Marginal Productivity Theory?
16. What are advantages of Modern Theory of Interest?
17. How the Market Labor Supply curve is derived?
18. What is Accounting Profit?
19. What are different forms of Economic Rent?

Part - C

(Each question carries **Five** marks)

UNIT – I

1. Explain the indifference curve approach.
2. Explain law of supply and state its assumptions.
3. What are the assumptions and exceptions for Law of demand?
4. Explain methods for calculating elasticity of demand.
5. Explain law of demand and demand curve.
6. Differentiate between cardinal and ordinal utility approaches.
7. What is Cardinal Approach to Consumer Demand?
8. Explain the concept of Price Elasticity of Demand in detail.
9. What is an Indifference Curve? Explain its assumptions.
10. Explain the properties of Indifference Curve.
11. Explain the factors that determine Demand?
12. What are the factors determining Elasticity of Demand?
13. What are the factors that determine the factor prices?
14. Explain Forecasting Technique.
15. Explain the theory of Consumer Demand.
16. What do you mean by Elasticity of Demand? Explain its types.
17. What are different methods of estimating the price-elasticity of demand?
18. What is the difference between Demand and Supply of market?

Part - C

(Each question carries **Five** marks)

UNIT – II

1. Explain Total, fixed and variable cost in short run Law of production.
2. Explain marginal cost and average cost in short run Law of production.
3. Explain Economies of scale.
4. Explain diseconomies of scale.
5. Explain equilibrium of industry and firm in short run under perfect competition.
6. Explain equilibrium of industry and firm in long run under prefect competition.
7. What do you mean by Profit? Explain in detail.
8. What is production analysis? Explain in detail.
9. Explain the Theory of Cost.
10. What is theory of production?
11. Explain different types of Cost Function.
12. What are different causes of diseconomies of scale?
13. Differentiate economies and diseconomies of scale.
14. Differentiate modern theory of cost and traditional theory of cost.
15. Explain modern theory of cost.
16. State importance of Pricing Decisions.
17. What are different objectives of business firms?
18. Define Perfect Competition. Explin its features.

Part - C

(Each question carries **Five** marks)

UNIT – III

1. Differentiate monopolistic competition and perfect competition.
2. Explain the criticism on Baumol's theory of sales maximization.
3. Explain the concepts selling costs in detail.
4. Explain the factors that cause oligopoly.
5. Explain the concept of price discrimination under monopoly.
6. Explain Baumol's theory of sales maximization.
7. Explain different advantages of Monopoly.
8. Explain different kinds of monopolies?
9. State the importance of capacity utilization under monopoly.
10. What are different characteristics of Duopoly?
11. Explain the equilibrium of Multi-Plant Monopoly.
12. Differentiate Monopoly and Perfect Competition.
13. Explain Monopolistic Competition.
14. Explain equilibrium of firm under monopolistic competition.
15. Explain basic elements of Monopolistic Competition.
16. Explain Chamberlin's Theory of Monopolistic Competition.
17. Explain Non-Price Competition with its examples.
18. Explain an overview of Oligopoly Models.
19. Explain the assumptions of Cournet's Duopoly Model.
20. How does government regulate monopoly prices?

Part - C

(Each question carries **Five** marks)

NIT – IV

1. Explain Ricardian Theory of rent.
2. Explain the overview of Factor supply.
3. Explain Wage determination under perfect competition.
4. Explain relationship between elasticity of factor supply and economic rent.
5. Explain the concept of transfer earning with example.
6. How wage is determined under Product Monopoly?
7. Explain Factor Price with examples.
8. Difference Factor Demand and Factor Supply.
9. Explain the Supply curve of labor market.
10. How Economic Profit is calculated?
11. Explain the Theory of Individual Labor Supply.
12. State advantages of Ricardian Theory of rent.
13. Explain the theory of Rent.
14. Differentiate Rent and Quasi-Rent.
15. Explain Economic Rent with its types.
16. How do you calculate Accounting Profit? Explain.
17. Explain the concept of Wage Differentials with its types.
18. What is interest rate? Explain its different types.
19. What are Disadvantages of Modern Theory of Interest?

Part - C

(Each question carries **Ten** marks)

UNIT – I

1. Explain law of demand with a suitable example.
2. Explain economic concepts applied in business analysis.
3. Explain Basic problems of an economy.
4. What is Economy? Explain different kinds of Economic Systems.
5. Describe the law of supply with a suitable example.
6. Sate the Advantages and Disadvantages of Demand Forecasting.
7. Explain the law of diminishing marginal utility and assumptions of it.
8. Explain law of Diminishing Marginal Utility? What are its limitations?
9. Explain the different forms of Price Elasticity of Demand.
10. Define Demand Forecasting and explain its Methods.
11. What are the exceptions of Law of Demand?
12. Explain meaning and characteristics of Demand Forecasting.
13. Define A Free Enterprise Economy. Explain with examples how it works.
14. Explain the Advantages and Disadvantages of Business Economics.
15. Define Economics. Explain its Nature and Scope.
16. Explain the basic problems of an economy with solutions.
17. Explain the assumptions law of demand.

Part - C

(Each question carries **Ten** marks)

UNIT – II

1. Explain the law of variable proportions.
2. Explain different types of market structure with example.
3. Explain various laws of return to scale.
4. Explain various types of accounting costs.
5. Explain various economies and diseconomies of scale.
6. Explain in detail different laws of production?
7. Define Market Structure. Explain its characteristics.
8. Explain in detail the theory of Cost with its function.
9. Explain the derivation of Supply curve in short-Run and Long-Run.
10. Explain in detail how Price and output is determined under Perfect Competition.
11. Explain the Theories of Cost in detail.
12. How the firm's objectives are achieved on the basis of Market Structure?
13. What is Cost analysis and Business Analysis?
14. Explain Production Theory in detail.
15. Explain the relationship between the Market Structure and Degree of Competition in detail.
16. Explain advantages and disadvantages of Perfect Competition.
17. Explain the Equilibrium of the Firm and Industry in detail.
18. Define Production Function. Explain its Characteristics in detail.

Part - C

(Each question carries **Ten** marks)

UNIT – III

1. Explain price and output determination in short run monopoly.
2. Define Monopoly. Explain the measures of monopoly power in detail.
3. Explain short term equilibrium of monopolistic competition.
4. Explain Sweezy's kinked demand curve model for oligopoly.
5. Explain application of game theory to oligopolistic strategy.
6. Explain the concept of Industry and product groups under monopolistic competition.
7. What is Monopoly? Explain how prices are determined in Monopolistic competition.
8. How the Price And Output Determined In Collusive Oligopoly
9. Differentiate collusive and non-collusive oligopoly.
10. Explain the Baumol's theory of Sales Maximation.
11. Explain the strategy in Game Theory in Detail?
12. What are the different uses of Game theory?
13. Explain different advantages and disadvantages of Duopoly.
14. Explain the Cournet's Duopoly Model.

Part - C

(Each question carries **Ten** marks)

UNIT – IV

1. Explain the derivation of labor demand curve.
2. Explain the classical theory of interest.
3. Explain in detail the Clark's Dynamic theory of profit.
4. Explain the derivation of individual labor supply curve.
5. State the critical evaluation of Ricardian theory of rent.
6. What are different theories of Wage Determination?
7. What is transfer earning? State the Importance of it.
8. Explain Keynesian theory of interest?
9. Define Profit and explain its different types.
10. Differentiate Profit and Pure Profit
11. Explain Different theories of Profit.
12. Difference between Accounting Profit and Economic Profit.
13. Define Consumer Demand. Explain Cardinal and Ordinal utility approaches.
14. Explain in detail Revealed Performance Theory.
15. What is Factor Market explain in detail.
16. Explain the theory of Quasi-Rent in detail.
17. What is the short-term rent on fixed Factors?
18. Explain the Loan able Fund Theory of Interest in detail.

QUESTION BANK
BACHELOR OF COMMERCE (COMPUTER APPLICATION) (BCCA)

Course: BCCA – II (Semester – IV) **Paper: 4T4 – PHP & MySQL**

Part - A

(Each question carries **Two** marks)

UNIT – I

1. What is Echo Statement?
2. What is Print Statement?
3. What is HTTP Protocol?
4. What is variable in PHP?
5. What is # statement in PHP?
6. What is <?php?
7. What is action in form control?
8. What is method in Form control?
9. What is Server Page?
10. What is Client page?

part - A

(Each question carries **Two** marks)

UNIT – II

1. What is Form Control in PHP?
2. What is Concatenating String in PHP?
3. What is New Line Feed in PHP?
4. What is decision making in PHP?
5. What is crypt() in PHP?
6. What is Strcmp() in PHP?
7. What is strstr() in PHP?
8. What is strops() in PHP?
9. What is syntax of if.. else in PHP?
10. What is asort() in PHP?
11. What is ksort() in PHP?
12. What is index array in PHP?

QUESTION BANK
BACHELOR OF COMMERCE (COMPUTER APPLICATION) (BCCA)

Course: BCCA – II (Semester – IV) **Paper: 4T4 – PHP & MySQL**

Part - A

(Each question carries **Two** marks)

UNIT – III

1. What is a CSS template?
2. What is include in PHP?
3. What is require in PHP?
4. What is date function?
5. What is constants?
6. What is Y,y and n in date() function?
7. What is cookies in PHP?
8. What is session in PHP?
9. What is function call in PHP?
10. What is return statement in function?

Part - A

(Each question carries **Two** marks)

UNIT – IV

1. What is file permission?
2. What is fopen function?
3. What is fread() function?
4. What is fclose function?
5. What is MySql?
6. What is connect in MySql?
7. What is use command in MySql?
8. Write down the syntax of create database command.
9. What is NULL in MySql?
10. What is AUTO_INCREMENT in MySql?

Part - B

(Each question carries **Three** marks)

UNIT – I

1. Differentiate between Print and Echo.
2. How we give the comments in PHP?
3. Write and explain PHP program syntax.
4. How to create variable in PHP?
5. What is GET method?
6. What is POST method?
7. What is debugging in PHP?
8. How to send html to browser?
9. Write Characteristics of PHP.
10. What is PHP Parser?

Part - B

(Each question carries **Three** marks)

UNIT – II

1. Write a PHP program to concatenate two strings.
2. Explain any three string functions in PHP.
3. Explain strtolower() and strtoupper().
4. Write a note on if.. else statement?
5. What is super global Variable?
6. What is nested if..else statement?
7. What is function in PHP?
8. What is library function in PHP?
9. What is empty() in PHP?
10. What is associative array in PHP?

Part - B

each question carries **Three** marks

UNIT – III

1. Write a note on Template in PHP.
2. Write a note on mail() function.
3. How to set Cookies in PHP?
4. Write a note on delete session in PHP.
5. Write a note on modify cookies in PHP.
6. What is session variable in PHP.
7. Write a note delete cookies.
8. What is isset() function?
9. What is session_start() function?What is htmlspecialchars() function?

(Each question carries **Three** marks)

UNIT – IV

1. What is GRANT Command?
2. How to create database and table MySql?
3. Write down mysql_connect() function in MySql?
4. Write down mysql_query() function in MySql?
5. Write down mysql_fetch_array() function MySql?
6. Write down mysql_num_rows() function in MySql
7. Write down the syntax and example insert command in MySql.
8. Write down the syntax and example Update Command in MySql.
9. Write down the syntax and example Date() function in MySql.
10. Write down the syntax and example delete command in MySql.

Part - C

(Each question carries **Five** marks)

UNIT – I

1. Explain different types of variables in PHP.
2. Explain form control in detail.
3. Write a note Comments in PHP.
4. Explain different Debugging steps in PHP.
5. Differentiate between Server Pages and Client Pages.
6. Explain comparison operators in PHP.
7. Explain the syntax of PHP program. Write a program to find square of 2.

Part - C

(Each question carries **Five** marks)

UNIT – II

1. Explain any four String function with example.
2. What is function? Explain user defined function with example.
3. What is array? Explain associative array with example.
4. Write a note on switch statement in PHP.
5. Explain if.. else statement. Write a program to print all even numbers from 1 to 100.
6. Explain for loop with example.
7. Explain array_splice() in PHP with example.
8. List and explain all sort functions in PHP.
9. Explain isset() function with example.
10. Explain any three super Global Variable with example.

Part - C
(Each question carries **Five** marks)
UNIT – III

1. Explain date function with five formatting character.
2. What is include statement explain with example.
3. What is require statement explain with example.
4. What is the difference between include and require statement.
5. Explain any two validation function with example.
6. How to send email in PHP? Explain with example.
7. Explain manipulating HTTP header with example.
8. Write note on cookies in PHP.
9. Write a note on session in PHP.
10. Write a note on $_SERVER['REQUEST_METHOD'].
11. What is function in PHP? Explain User defined function with example.

Part - C
(Each question carries **Five** marks)
UNIT – IV

1. Explain How to insert values from table in MySql.
2. Explain different data types in MySql.
3. Explain How to delete values from table in MySql.
4. Explain REVOKE command in MySql.
5. Explain UPDATE Command in MySql.
6. Explain mysql_fetch_array() function with example.
7. What is foreign key? Explain in detail with example.
8. How to get information about Database and Table? Explain.
9. Explain REGEXP in MySql.
10. Explain any three date function with example.

Part - C

(Each question carries **Ten** marks)

UNIT – I

1. Write a note on PHP, Explain How PHP Works in detail.
2. Explain in detail the role of Web Browser in detail.
3. Explain GET and POST method in detail.
4. What is Variable? Explain different types of variables.
5. Explain super Global variable in PHP? Explain with example.
6. What is manually sending data to a form? Explain with example.
7. What is Validation? Explain Different types of validations in detail.

Part - C

(Each question carries **Ten** marks)

UNIT – II

1. Explain in detail PHP Conditional Statement.
2. Explain different LOOPS in PHP with example.
3. What is array? Explain different types of array in detail with example.
4. Explain Sorting of array in detail.
5. Explain any five string functions with example.
6. What is function in PHP? Explain different types of functions with example.
7. Explain if…else statement in PHP with example.
8. Explain Switch statement with example.
9. Explain Index array and Associative array in detail.
10. Explain foreach loop in detail.

Part - C
(Each question carries **Ten** marks)
UNIT – III

1. Explain date function with 10 formatting characters.
2. Explain in detail cookies with example.
3. Explain in detail session with example .
4. What is function? Explain types of function in detail.
5. How to create, modify, delete cookies in PHP? Explain.
6. How to create ,modify, delete session in PHP? Explain.
7. Explain in detail validation functions in PHP.
8. Explain include and require functions in detail.
9. What is call by value and call by reference? Explain with example.
10. What is filter_var() function ? Write a program to validate email-id with proper message.

Part - C
(Each question carries **Ten** marks)
UNIT – IV

1. Explain MySql Privileges in detail.
2. Write a note on MySql Error Handling.
3. Explain any five date functions in MySql.
4. What is Pattern Matching in MySql? Explain.
5. How to Connect PHP with MySql? Explain.
6. Explain the process of Creating Table, Deleting table in MySql.
7. Explain any ten Data types in MySql with example.

Department of Computer Science
Subject: System Analysis & Design(Paper II)
Class:- B.Sc II Sem
Question Bank

UNIT I

1. Define system in brief and explain components of computerized information system.
2. Draw system development life cycle and explain its phases in brief.
3. What is feasibility study? Explain organizational and technological feasibility.
4. What is questionnaire? Design a questionnaire to know the internet awareness program among different age group users.
5. Explain System Development Life Cycle (SDLC).
6. Explain following data collection methods :
(i) Questionnaires
(ii) Interview
7. Give classification of systems. Explain open system and closed system with example.
8. What is Feasibility Study? Explain organizational and technological feasibility.
9. What for interview technique is used ? Differentiate between structured and unstructured interview.
10. Explain the following fact finding techniques :
(i) Brain storming
(ii) Observation

UNIT II

1. **Explain basic objective of input design and guideline of input design.**
2. **Construct Decision Table for the following problem : A computer file has customer name, type, bill number, bill date, amount and date of payment. If the customer is a dealer and pays his bills within 30 days, 10% discount is allowed. If it is 30 to 45 days, discount and surcharge is zero. If he pays after 45 days, he has to pay 10% surcharge. The corresponding percentages for a manufacturer are 10%, 0, 12.5%.**
3. **What is form design? Explain types of form and write principles of form design.**
4. **Why is training important? Describe training methods in brief.**
5. **What is Decision Tree? Construct Decision Tree for : Co-operative Bank has the following policy on deposit :**
   - **(1) On deposit of Rs. 10,000 /- and above and for 3 years or above, interest 15%.**
   - **(2) On the same deposit for period less than 3 years 12%.**
   - **(3) On deposit below Rs. 10,000 /- interest 10% regardless of the period of deposit.**
6. **What is Decision tree? Explain how it is used for making decision with examples.**
7. **List different types of code.**
8. **Explain physical representation of codes.**
9. **Explain the use of data flow diagram and specify the different symbols used in drawing a DFD with suitable example.**
10. **Explain different validation checks which can be applied to input design.**
11. **List main categories of output and explain any four.**
12. **Write principles of code design.**

UNIT III

1. **Write short note on Data Dictionary.**
2. **Explain principles of code design**
3. **Write objective of system testing and explain any three types of testing**
4. **Write a short note on project monitoring and control.**
5. **What is project planning? Explain different factors considered in project planning.**
6. **What is software maintenance? Give different characteristics of software maintenance.**
7. **What is cost benefit analysis? Explain in brief.**
8. **Write notes on :**
    a. **Software Reliability.**
    b. **ISO 9000.**
9. **What is training? List different activities in training.**
10. **Write notes on following testing methods :**
    a. **Function Testing**
    b. **Subsystem Testing**
    c. **System Testing.**
11. **What is system testing? State and explain different levels of system testing.**
12. **Explain following conversion methods :**
    a. **Cold Turkey**
    b. **Pilot method.**

UNIT IV

1. **What is cost benefit analysis? Explain in brief.**
2. **Explain system tolerance in system design.**
3. **How to make planning to implement change?**
4. **Write a short note on Risk Management.**
5. **What is software maintenance? Give different characteristics of software maintenance.. What is project planning?**
6. **What are different factors that should be considered in project planning? List the major responsibilities of a software project manager.**
7. **Explain work breakdown structure and activity network model.**
8. **Discuss the following attributes which a software product must have :**
   - **(i) Portability**
   - **(ii) Maintainability**
   - **(iii) Reusability**
   - **(iv) Adaptive**
   - **(v) Perfective.**
9. **Discuss skills that a software project manager should possess.**
10. **Draw maintenance process model-2.**
11. **Discuss skills that a software project manager should possess.**
12. **Explain critical path method with example.**

QUESTION BANK

BACHELOR OF COMMERCE (COMPUTER APPLICATION) (BCCA)

Course: BCCA – III (Semester – V) **Subject: System Analysis & Design**

Part - A

(Each question carries **Two** marks)

UNIT – I

1. Define system
2. Write any two characteristics of system
3. What are the elements of system?
4. Write the three types of system.
5. What is SDLC?
6. Define prototyping.
7. Define system analyst.
8. Write any one role of system analyst.
9. What is MIS?
10. What is the role of analyst in MIS organization?

Part - B

(Each question carries **Three** marks)

UNIT – I

1. What the characteristics of systems?
2. Differentiate Formal or Informal and Physical or Abstract systems.
3. Write the difference between Open or close and Manual or Automated system.
4. What are the elements of systems?
5. Differentiate structured analysis and structured design
6. Why do organization need systems analysts?
7. Who are the internal and external users of information system?
8. Differentiate business analyst and system analyst.
9. What is the role of system analyst as change agent?
10. Write any three duties of system analyst.

Part - C

(Each question carries **Five** marks)

UNIT – I

1. What is system? Explain the characteristics and types of system element.
2. Write short note on MIS
3. Explain the function of OAS.
4. Explain decision supportive system in details.
5. Differentiate data and information.
6. Define system. Explain the objectives of system.
7. Describe the types of elements.
8. Describe man made system in details.
9. What are online and real time systems? Explain.
10. What are the stages of feasibility study?

Part - C

(Each question carries **Ten** marks)

UNIT – I

1. Define SDLC. Explain with all stages of SDLC.
2. Describe implementation and post implementation in maintenance.
3. Describe the role system analyst.
4. Describe the role of data administrator.
5. Write short note on:
   a)TPS
   b)OAS
6. Explain Management Information System(MIS) in brief. Give and explain any four tools of MIS.
7. Explain KWS in details.
8. Describe expert system in an organization.
9. Explain the term Organization, Interaction and interdependence of a system.
10. Discuss the concepts of MIS and DSS .How are they related? How do they differ?

Part - A

(Each question carries **Two** marks)

UNIT – II

1. Define information gathering.
2. List out the different methods of information gathering.
3. What are the different tools used for information gathering?
4. What are the tools of structured analysis?
5. Define feasibility study.
6. What is questionnaire in information gathering?
7. What is observation in information gathering?
8. Define operational feasibility.
9. What is a structured interview?
10. Define cost benefit analysis.

Part - B

(Each question carries **Three** marks)

UNIT – II

1. Define information .What are different tools of Information Gathering?
2. What is structured analysis? Differentiate decision trees and decision tables.
3. What is an on-site observation? Write any three disadvantages of On – Site Observation.
4. Why initial investigation is important?
5. Define DFD. Elaborate the symbols of DFD with example.
6. What is data dictionary?
7. How data dictionary is differ from traditional approach?
8. What are the traditional information gathering tools are available for the analyst?
9. List and explain the primary steps in interviews.
10. Differentiate open ended and close ended with example.

Part - C

(Each question carries **Five** marks)

UNIT – II

1. In what respect is interviewing an art? Explain.
2. Differentiate structured and unstructured questionnaire.
3. Describe the advantages and limitations of interviews and questionnaire.
4. Explain the types of interviews.
5. Describe the types of questionnaire.
6. Why review of literature is important in information gathering?
7. Why do we need the information?
8. Write short note on:
    a. Data flow diagram
    b. Data dictionary
9. In what way data flow diagram and decision tree related?

Part - C

(Each question carries **Ten** marks)

UNIT – II

1. Define information gathering. Describe tools for information gathering.
2. What is structured analysis? Explain tools of structured analysis.
3. Explain interviews and questionnaire with examples.
4. Describe the importance of review of Literature, procedures and forms in information gathering.
5. Write short note on -
    a. Data flow diagram
    b. Decision table and decision tree
6. Describe all the phases of feasibility study.

Part - A

(Each question carries **Two** marks)

UNIT – III

1. Define system design.
2. What is logical design?
3. What is physical design?
4. What is structured design?
5. Define input data.
6. Define output design.
7. What is form?
8. What are the types of forms?
9. What are the requirements of form design?
10. Differentiate snapout and fanfold form.
11. Define file.
12. Define sequential organization.
13. Define entities.
14. What is Attributes?
15. Write any two objectives of data base.

Part - B

(Each question carries **Three** marks)

UNIT – III

1. What is logical and physical design?
2. What is structured design? Explain any two of them.
3. What is audit trail?
4. What are the advantages of top-down design?
5. Why audit consideration is important in system design?
6. What is the goal of input design?
7. Define data structure. What are the major types?
8. What features does a relational DBMS offer?
9. Differentiate sequential and indexed sequential files.
10. What is documentation control?

Part - C

(Each question carries **Five** marks)

UNIT – III

1. Define process design. Explain logical and physical design.
2. What is design methodology? Explain HIPO and IPO chart.
3. Explain Documentation control.
4. Define structured design .How it is related to DFD?
5. Explain the key elements of a structure chart.
6. How HIPO chart related to structured design? What are its objectives?
7. What audit considerations are included in system design? Why they are important?
8. What is the goal of input design?
9. Explain briefly three approaches for data entry.
10. escribe form control.

Part - C

(Each question carries **Ten** marks)

UNIT – III

1. Describe the role of data administrator.
2. Describe entities, attributes and their values with example.
3. Distinguish between:
   a) Schema and subschema
   b) Logical and physical view of data
   c) Relation and Tuple
4. Define Data structure. What are major types? Illustrate
5. Differentiate Sequential and indexed sequential file organization with example.
6. Define entities and attributes with example. Describe types of relationship among entities with the help of Entity – Relationship Diagram.
7. Define relationship DBMS with its objectives and features.
8. Describe hierarchy of files. Also explain sequential organization and indexed sequential organization.

Part - A

Each question carries **Two** marks)

UNIT – IV

1. Define testing?
2. What is error?
3. What is system error?
4. List out the types of system test.
5. Define program testing.
6. Define string testing.
7. What is quality assurance?
8. List out the factors for quality factors.
9. What is implementation?
10. What is conversion?
11. What are the major activities in conversion?
12. Define hardware and software.

Part - B

(Each question carries **Three** marks)

UNIT – IV

1. Why do we test system? Explain.
2. Elaborate the importance of testing.
3. What are the types of test data are used in system testing?
4. What is syntax error? How it is differ from logic error? Give an example.
5. Define quality assurance. Discuss the factors that affect the quality of a system.
6. What is implementation? How it is differ from conversion?
7. Distinguish between parallel processing and system processing
8. What is the role of audit control trail in conversion?
9. What is the main procedure of software selection?
10. Write important steps for hardware selection.
11. What is the role of consultant?
12. What is evaluation and validation?

Part - C
(Each question carries **Five** marks)
UNIT – IV

1. Write short note on –(a)System testing (b)Quality assurance
2. What level of quality assurance must a system meet? Explain
3. Explain the procedure of post implementation review.
4. Elaborate the steps of maintenance procedure.
5. Describe the steps of software maintenance.
6. Differentiate maintenance and enhancement.
7. Write down the procedures for financial consideration in selection of software.
8. What is software? List out the steps of criteria for selection of software.
9. Write short note on vendor collection.
10. Explain the art of negotiation.

Part - C
(Each question carries **Ten** marks)
UNIT – IV

1. What is error? Explain types of error. Also describe the importance of testing.
2. What are the factors must be considered prior to system selection? Explain.
3. Differentiate:
   a) Reliability and security
   b) Performance and serviceability
   c) Functionality and Flexibility
4. In what way is computer negotiating an art? Explain.
5. How is computer industry classified? Explain.
6. Explain the following terms:
   a) Implementation
   b) User training
   c) Documentation
   d) Change agent

1) Theorem : Cauchy theorem for abelian group.
2) State and prove first sylow theorem.
3) Statement: let G be the finite group and let p be a prime then all sylow p subgroup of G are conjugate and their number np divides o(G) and stastifies n_p=l(mod p).
4) Prove that a sylow p-subgroup of a finite group G is unique iff it is normal.
5) If o(G)=pq, p and q are distinct primes and p<q. Show that if p does not divide (q-1),then G is Cyclic.
6) Show that every group of order p^2, p is prime is either cyclic or is isomorphic to the direct product of two cyclic groups each of order p.
7) Example: There is no simple group of order 63,56,36.
8) Example: Let o(G)=30,Show that,
   I. Either sylow 3-subgroup or sylow 5-subgroup is normal in G.
   II. G has a normal subgroup of order 15.
   III. Both sylow 3-subgroup and sylow 5-subgroup are normal in G.
9) Show that the set an of all even permutation of Sn is a normal subgroup of Sn and o(An)=n!/2.
10) The alternative group An is simple if n>4, consequently, sn is not solvable if n>4.
11) Let H_1 & H_2 be normal in G then G is an internal direct product of H_1 & H_2 iff
    (a) G = H_1 H_2
    (b) H_1 n H_2 ={e }
12) If a group of order p^n contains exactly one subgroup each of order P,P^2,..... P^{n-1} then it is cyclic.
13) Let A and B be finite cyclic group of order m & n resp. Prove that A*B is cyclic iff m & n are relatively Prime (i.e.(m,n)=1).
14) If G be group & suppose G is internal direct product of H_1,H_2, ..., H_N. Let T be External direct product of H_1,H_2, ..., H_N then G & T are isomorphic.

15) Theorem : Let $H_1,H_2,.....H_n$ be normal in G , then G is on IDP of $H_1,H_2,.....H_n$ iff (a) $G=H_1,H_2,.....H_n$
(b) $H_i \cap H_j =\{e\}$ $i \neq j, Gi=1,2,...,n$ or $H_i \cap H_j, H_2, ... H_{i-1}, H_{j+1}, ..H_n) =\{e\}$.

16) Let A Be finite abelian group . Then there exists a unique list of integers $m_1,m_2,....,m_k$(all>1) such that

$|A|=m_1,....,m_k$, $m_1|m_2|....|m_k$,
And $A = C_1 \oplus ..... \oplus C_K$, where C1,.....,CK are cyclic subgroups of A of order $m_1,...,m_K$ resp, consequently, $A= Zm_1 \oplus ..... \oplus Zm_K$.

17) Theorem : If E is a finite Extension of a field F, then $|G(E/F)|<=[E:F]$.
18) Define Automorphism and fixed field
19) Example: G=G(C/R) Let G1=G(C/R) then prove that $|G1|=Z$.
20) Prove Lemma (Dedekind)
21) Define Automorphism group
22) Theorem: Let $H = \{e=g,.... g_n\}$ & Let $[E:E_H]=m$. If possible ,suppose m<n. Let $\{a,.... a_m\}$ be a basic for E over E_H.
23) Theorem: Let E be a finite separable extension of a field F Then the following are equivalent.
   I. E is a normal extension of F.
   II. F is the fixed field of G(E/F)
   III. [E:F] = |G(E/F)|.

24) State Fundamental theorem of Galois theory.
25) Theorem: Every polynomial $f(x) \in c[x]$ factors into linear factor in c[x].
26) Definition of Galois group
27) Define Integral domain.
28) Let R be an integral domain with unity a ,b ∈ R be two non_zero elements s.t. a|b or b|a ,a and b are asdociates and conversely.

29) Define Prime element

30) Theorem: An irreducible element in a commutative principle ideal domain(PID) is always prime element.

31) If R is UFD, then the factorization of element in R as a finite product of irreducible factors is unique to within order and unit factor.

32) Define Associates element

33) Let R be UFD and $a,b \in R$ then there exist an greatest common divisor of a & b that is unique determined to within an orbitory unit factors.

34) Theorem: Every PID is a UFD but UFD is not necessary a PID.

35) Define Irreducible element

36) Theorem: Every Euclidean domain is a PID.

37) Theorem: Every Euclidean domain is a UFD.

38) Prove that CID $R=\{a+b\sqrt{-5}/a,b \in Z\}$is not a UFD.

39) Define Unique factorization domain.

40) Theorem: Let R be a unique factorization domain. Then the poly ring R[x] over R is also a unique factorization domain

41) Theorem: Let R =F[x] be a poly ring over a commutative integral domain F. Let f(x) and $g(x) \neq 0$ be poly in F[x] of degrees m & n repectively. Let K= max(m-n+1,0) and 'a' be the leading coeff of g(x). then unique poly q(x)&r(x)

in F[X] s.t $a^k(f)=q(x).g(x)+r(x)$ wherenr(x) has degree less than the degree of g(x).

M.Sc. Mathematics
Subject: Mathematical Method

1) Find the radius of convergent for the following power series:
   a)$\sum_{n=0}^{\infty} n!\, x$n
2) For the differential equation y'+y =1, find a power series solution of the form ∑ an xn and try to recognize the resulting series as the expansion of a familiar function. Also ,verify your conclusion by solving the equation directly.
3) Theorem- Let x_0 be an ordinary point of the differential equation: y" +P(x)y' +Q (x)y=0
4) Find the general solution of y"+y=0 in terms of power series in x.can you express this solution by means of elementary function?
5) Verify that the solution y"+ y'-xy =0 has a three term recursion formula,and find its series solution y1(x) &y2(x) such that (a) y1(0) =1 (b)y1'(0)=0
6) Find the indicial equation and its roots for the differential equation x^3 y''+(cos 2x -1)y' +2xy
7) For the following differential equation , locate and classify its singular points on the x-axis:
8) Bessel's equation of order zero x^2y''+xy'+x2y=0.Show that its indicial equation has only one root,and corresponding Frobenius series solution is y =$\sum_{n=0}^{\infty}(-1)$n/2n(n!) x2n.
9) Legendre's function of the first kind(or Legendre's polynomial of degree n).
10) Show that all the roots of Pn(x)=0 are distinct.
11) Show that all the roots of Pn(x)=0 are not distinct must be wrong.
12) Show that Pn(1)=1 and Pn(-x)=(-1)nPn(x).Hence or otherwise deduce that Pn(-1)=(-1)n.
13) Determine the polynomials Pn(x)for n=0,1,2,3,4,5
14) Find series of Legendre's polynomials for x^2
15) Recurrence formula for the Legendre's polynomial Pn(x) (2n+1)xpn=(n=1)Pn+1+ nPn-1.
16) nPn= xP'n-P'n-1

17) Orthogonality of Legendre's polynpmial.
18) Recurrence Formula for the Bessel's function jn(x)
19) For the differential equation y'+y =1, find a power series solution of the form $\sum$ an xn and try to recognize the resulting series as the expansion of a familiar function. Also ,verify your conclusion by solving the equation directly.
20) Prove that Jn(x)=0 has no repeated roots except at x=0
21) Sectional or piecewise continuity.
22) Existence of Laplace Transform of f(t).
23) Laplace Transform of Some Elementry Function. L{1}=1/s ,s>0
24) Properties of Laplace Transforms. A)Linearity Properties B)First Shifting .
25) Laplace Transform of Derivative of f(t).
26) Laplace Transform of Integral of f(t).
27) Laplace Transform of f(t)/t (Division by t)
28) Evaluate L{t2 cos2t}
29) Find the Laplace transform of the following functions t sin at.
30) Evaluation of Integrals.
31) Unit step function.
32) Laplace Transform of Unit step function
33) Find the Laplace transform t2 u (t-3)
34) Define : Periodic Function.
35) Laplace transform of Bessel Function j0(t) and j1(t).
36) Inverse Laplace Transforms.
37) Properties of Inverse Laplace Transforms.
38) Linearity Properties.
39) Explain Second shifting Property.
40) Find the Inverse Laplace transform of the following function.a)s/s^2

QUESTION BANK
Msc MATHEMATICS 1ST YR SEM II

1) Prove that there is no rational number whose square is 12.
2) Under what conditions does equality hold in the Schwarz inequality?
3) If z is a complex number , prove that there exists an r>0 and a complex number w with |w|=1 such that z=rw . Are w and r always uniquely determined by z ?
4) If x , y are complex , prove that ||x|-|y||<|x-y|.
5) Prove that no order can be defined in the complex field that turns it into an ordered field.
6) Prove Proposition.
7) Prove that the empty set is a subset of every set.
8) Prove that there exist real numbers which are not algebraic.
9) Is the set of all irrational real numbers countable ?
10) Are closures and interiors of connected sets always connected ?
11) Prove that every compact metric space K has a countable base, and that K is therefore separable .
12) Prove that every open set in R1 is the union of an at most countable collection of disjoint segment.
13) Prove that the Cauchy product of two absolutely convergent series converges absolutely.
14) Definition 3.21 can be extended to the case in which the a_n lie in some fixed R^k.Absolute convergence is defined as convergence of$\sum |a_n|$.Show that Theorems 3.22,3.23,3.25(a),3.33,3.34,3.45,3.47, and 3.55 are true in this more general setting. (only slight modification are required in any of the proofs.)

15) Prove that If $\sum a_n = A$, and $\sum b_n = B$, then $\sum(a_n + b_n) = A+B$, and $\sum ca_n = Ca$, for any fixed c.
16) Let f be a real uniformly continuous function on the bounded set E in R^1 .prove that f is bounded on E. Show that the conclusion is false if boundedness of Eis omitted from the hypothesis.
17) A uniformly continuous function of a uniformly continuous function is uniformly continuous. State this mc :cisely and prove it.
18) Suppose f is a real function defined or. .. satisfies.
19) If $f(x) = |x|^3$,compute f'(x),f"(x) for all real x, and show that $f^{(3)}(0)$ does not exist
20) Let f be defined for all real x, and suppose that $|f(x)-f(y) \leq (x-y)^2$.
21) Formulate and prove an inequality which follows from Taylor's theorem which remains valid for vector-valued function.
22) Prove that every uniformly convergent sequence of bounded function is uniformly bounded.
23) State and prove Parseval's theorem.
24) Prove that Let r be a positive integer . If a vector space X is spanned by a set of r vectors , then dim X≤r.
25) If S is a non empty subset of a vector space X , prove (as asserted in sec.9.1) that the span of S is a vector space.
26) Assume A £ L(X, Y) and Ax =0 only when X = 0. Prove that A is then 1-1.
27) Suppose that f is a real valued function defined in an open set E¢R^n , and that f has a local maximum at a point X £ E. Prove that f' (x) =0.
28) Show that the existence (and even the continuity) of D_{12} f does not imply the existence of D_1 f . For example let f(x,y) =g(x), where g is nowhere differentiable .
29) Give a similar discussion for $f(x,y) = 2x^3 + 6xy^2 - 3x^2 + 3y^2$.
30) State and prove the Lebesgue's dominated convergence theorem.
31) Prove that the function F given by (96) is continuous on [a , b].

32) Prove that a complex function f is measurable if and only if f^{-1} (V) is measurable for every open set V in the plane.

33) (a) Show that the simplex Q^k is the smallest convex subset of R^k that contains $0, e_1, \ldots, e_k$.(b) show that affine mappings take convex sets to convex sets.

34) Answer analogous questions for the mapping defined by $u = x^2 - y^2$, $v = 2xy$.

35) Take n = m = 1 in the implicit function theorem , and interpret the theorem (as well as its proof) graphically.

36) If f (x) = 0 for all irrational x, f(x) = 1 for all rational x , prove that f€R on [a , b] for any a < b.

37) Let f be a continuous real function on R^1, of which it is known that f'(x) exists for all $x \neq 0$ and that f' (x) $\rightarrow 3$ as $x \rightarrow 0$. Does it follow that f'(0) exists?

38) Let X be the metric space whose points are the rational numbers , with the metric $d(x , y) = |x - y|$. what is the completion of this space?

39) Prove that the Cauchy product of two absolutely convergent series converges absolutely.

40) If $\{ f_n \}$ is a sequence of measurable functions , prove that the set of points x at which $\{f_n(x)\}$ converges is measurable.

QUESTION BANK

M.Sc. MATHEMATICES 1st YR SEM II

Operational Research

1) Discuss the origin and development of OR. What are the limitations of OR? How computer has helped in popularizing OR?
2) Describe some methods of OR.
3) Operations research. What, where, why and how?
4) Discuss the significance and scope of OR in modern management.
5) Explain how and why OR methods have been valuable in aiding executive decisions.
6) "Model building is the essence of OR approach '. Discuss.
7) What are the essential characteristics of a linear programming model?
8) Explain the terms: key decision, objective alternatives and constraints in the context of linear optimization models by assuming a suitable industrial situation.
9) What is linear programming? Discuss the application of linear programming to managerial decision making.
10) A card is drawn from a deck of cards. What is the probability that the card drawn is a heart? What is the probability that the card drawn is an ace?
11) An urn contains 10 black ,15 white and 10 red balls. What is the probability of drawing a black, a white or a red ball?
12) What is Complementary Events?
12) State and explain Bayes' theorem.
13) Define RANDOM VARIABLES.
14) What is central tendency?
15) Explain Bernoulli Trial and Binomial Distribution.
16) Consider the tossing of a fair coin. Find the probability of getting exactly two heads (In any order) on the three tosses of the fair coin.
17) If on an average 8 ships out of 10 arrive safely at a port, find the mean and standard deviation of the number of ships arriving safely out of a total of 1,600 ships.
18) Differentiate between
    (i) Mutually exclusive events and non-exclusive events.
    (ii) Conditional and joint probabilities.

19) Why does the normal distribution hold the most honorable position in probability Theory.
20) What are the axioms of probability?
21) What is the sample space for the experiment which consists of drawing one ball from an urn containing 8 balls of which 3 are green and 5 are red? The balls have been numbered 1 through 8.
22) Write short note on the value of perfect information.
23) Write Advantages and Limitations of the Decision Tree Approach.
24) Explain Utility Theory.
25) Write Characteristic of game.

26) Write Limitations of Break-Even Analysis.
27) Explain Payback Period Method.
28) Calculate the NPV for a project which initially costs Rs. 5,000 and generates year end cash inflows of Rs. 1,800 , Rs. 1,600 , Rs. 1,400 , Rs. 1,200 and Rs. 1,000 respectively in the five years of its life. Assume rate of return as 10%.
29) What is investment analysis? Why is it of great significance to a firm?
30) Write Applications of QUEUING MODELS.
31) Discuss the costs associated with queuing system. Also explain the concepts of optimum servicing rate and optimum cost.
32) Define a queue and explain the various queue disciplines.
33) Write a note on various assumptions made in single-channel queuing theory.
34) Trains arrive at the yard every 15 minutes and the service time is 33 minutes. If the line capacity of the yard is limited to 4 trains, find
(i)The probability that the yard is empty,
(ii)the average number of trains in the system.
35) Derive a relationship for expected number of customers in queue for infinite Population, multichannel Poisson arrival and exponential service system.
36) The demand for a commodity is 100 units per day. Every time an order is placed, a fixed cost of Rs. 400 is incurred. Holding cost is Rs. 0.08 per unit per day. If the lead time is 13 days, determine the economic lot size and the recorder point.
37) Define inventory. What are the advantages and disadvantages of having inventories?
38) Derive EOQ formula for an inventory model with finite production rate and shortages permitted.
39) What is ABC Analysis? and write its advantages.
40) What is periodic review system? State its advantages and disadvantages.

Unit 1

1. Find the integral curves of the set of equations dx/x(y-z)=dy/y(z-x)=dz/z(x-y)
2. Find the integral curves dx/xz-y=dy/yz-x=dz/1-z^2
3. Theorem Pfaffian or Total differential equations
4. Theorem Exact or integrable DE
5. ydx+xdy=2zdz=0
6. Solve the equations(x^2z-y^3)dx+3xy^2dy+x^3dz=0 ,first showing that it is integrable
7. Solve ydx+xdy+2zdz=0
8. Verify the equation yz(y+z)dx+xz(x+z)dy+xy(x+y)dz=0 is integrable and find it's solution
9. Natani's Method
10. Solve (1+yz)dx+x(z-x)dy-(1+xy)dz=0

Unit 2

11. Theorem: Solution of the PDE
12. Find general integral of the PDE y^2p-xyq=x(z-2y)
13. Find the general integral of PDE px(x+y)=qy(x+y)-(x-y)(2x+2y+z)
14. Find the integral surface of the equation (x-y)y^2p+(y-x)x^2q=(x^2+y^2)z

15. Show that the equations xp-yq=x and x^2p+q=xz are compatible and find their solutions

16. Charpit's Method

17. Find the complete integral of pq=1,by charpit's method

18. Find the complete integral of z^2 =pqxy

19. Jacobi's Method for Solving F(x,y,z,p,q)=0

20. Find the complete integral of p^2x+q^2y=z

Unit 3

21. Solve xys=1

22. Solve ys+p=cos(x+y)-y(sinx+y)

23. Solve s-t=x/y^2

24. (D^3-6D^2D'+11DD'^2-6D'^3)=0

25. Solve (2D^2-DD'-3D'^2)z=5e^x-y

26. 4r-4s+t=16log(x+y)

27. Theorem:(1 or 2)_ Reducible no-homogeneous PDE

28. (D^2+D'^2-2DD'-3D+3D'+2)z=e^2x-y

29. (D^2-D')z=xe^x+y

30.Solve yt-q=xy

Unit 4

31. Find the distance of order zero between the functions y=x^2 and y=x on the interval [0,1]

32. Theorem: Euler's Differential Equation

33. If the function F is independent of x then F-y'dF/dy'=constant

34. If the function f depends on y alone i.e., F=f(y) then dF/dy=0

35. Find the shortest curve joininig the points (x1,y1) and (x2,y2) in a plane

36. Brachistochrone Problem

37. Functional Dependent on Higher Order Derivatives Theorem(Euler-Poisson Equations)

38. Invariance of Euler's Equation under Co-ordinate Transformation

39. Find the curves joining the points A(x1,y1) and B(x2,y2) that yields a surface of revolution of minimum area when revolved about the x-axis

40. Euler's Ostrogradsky Equation

Department of Computer Science
Class: M.Sc IV Sem
Subject : Advances in IT
Question Bank

Unit I

1. **What do you mean by software ? Explain system software and application software.**
2. **Explain Data Base Management System in detail.**
3. **What do you mean by Mail Merge ? Explain spreadsheet in detail.**
4. **Explain characteristics of good programming language.**
5. **Explain advantages and disadvantages of Machine Language.**
6. **Explain different types of programming languages with example.**
7. **Explain Mail Merge in detail.**
8. **Write notes on the following :**
   - **(i) Assembly language**
   - **(ii) High level language.**
9. **Explain different types of functions in MS-Excel.**
10. **Give the objectives of Database Management System.**

Unit II

1. **Explain various forms of data communication.**
2. **Write a note on data transmission media :**
   - **(i) Twisted pair**
   - **(ii) Co-axial.**
3. **Explain different types of network.**
4. **What is Topology ? Explain different types of topology.**
5. **Explain advantage and limitation of Star Topology.**
6. **Write notes on the following :**
7. **Analog communication**
8. **Digital communication.**
9. **Explain different types of Network topology with advantages.**
10. **What is transmission media ? Explain Twisted pair and Fibre optic cable with example.**
11. **Explain modems and multiplexing in detail.**
12. **Explain Satellite communication.**

Unit III

1. **Explain brief history and development of Internet.**
2. **What is Internet ? Explain Intranet and Extranet in detail.**
3. **What do you mean by virus ? Explain different types of virus.**
4. **Write short notes on :**
   - **(i) Firewall**
   - **(ii) Anti-spy.**
5. **Explain Open Source Software.**
6. **Explain different features of E-commerce in detail.**
7. **Explain open source software in detail.**
8. **Write notes on the following :**
   - **(i) URL**
   - **(ii) Shell Account.**
9. **What is virus ? Explain type of viruses.**
10. **Explain various Internet Applications.**

Unit IV

1. **Write notes on :**
   - **(i) Mobile Internet**
   - **(ii) GPS.**
2. **Explain different types of E-Commerce and their utilities.**
3. **Explain Mobile Computing and Cloud Technology.**
4. **Write notes on :**
   - **(i) Neural Network**
   - **(ii) Grid Computing.**
5. **Explain Data Mining.**
6. **Write notes on the following :**
   - **(i) Bluetooth**
   - **(ii) Wireless Application Protocol.**
7. **What is mobile computing ? Give advantages of Bioinformatics.**
8. **Explain Neural Network in detail.**
9. **Discuss Artificial Intelligence and Expert System in detail.**
10. **Define the terms Distributed Computing and Data Mining.**

QUESTION BANK

Class: M.Sc III sem

Subject: Data Communication Network (DCN)

Unit I:

1. Explain the design issues of Data Link Layer.
2. Explain Elementary data link protocols.
3. Explain Digital Transmission in detail.
4. Explain congestion control algorithms in brief.
5. Explain OSI reference model with well labelled diagram.
6. Explain in detail the congestion control algorithm of Network Layer.
7. Write a short note on services provided by Physical Layer to Data Link Layer.
8. Explain with well labelled diagram the services provided by Data Link Layer.
9. What is ISDN? Explain the architecture of ISDN.
10. What is congestion control? Explain congestion control in virtual circuit subnets.
11. What is sliding window protocol? Explain in detail.
12. What are the functions of Physical Layer ?

UNIT II:

1. Explain any two data compression techniques in detail.
2. What are the elements of a transport protocol ? Explain in detail.
3. Write a note on 'Virtual Terminals'.
4. Explain working of Remote Procedure Calls.
5. Explain the different methods of data compression.
6. Describe the design issues of Transport Layer in detail.
7. Explain file access and management methods at Application Layer.
8. Describe the process of file transfer in Application Layer.
9. What are Virtual Terminals? Explain in detail.

UNIT III:

1. What is Cryptography? Explain different Cryptographic Techniques.
2. Write a note on 'IDEA algorithm'.
3. Explain conventional encryption DES.
4. What is cipher block chaining? Explain with a suitable example.
5. Explain in detail the threats to a Network.
6. Write notes of following :
   (i) Passive Attacks
   (ii) Active Attacks

7. Explain in detail the encryption devices and their location.
8. Explain Cipher block mode of operation in detail.
9. Explain in brief encryption devices and their location.
10. Explain the working of DES algorithm.
11. Explain the classification of security services in detail.
12. Explain symmetric key encryption with suitable example.

UNIT IV:

1. Write a note on Packet Filtering and Firewalls.
2. Explain Intrusion Detection techniques in detail.
3. Explain password-based authentication in detail.
4. Explain SHA algorithm in detail.
5. Describe in detail the Diffie-Hellman Key Exchange.
6. Write a short note on Intrusion Detection Techniques.
7. Write short notes on :
    a. Hash Function
    b. Message Digests
8. What is message digest ? Explain in brief.
9. Explain Email security in brief.
10. What is the difference between Packet Filter and Stateful Firewall ?
11. What is Packet Filtering ? Explain.
12. Explain RSA Public Key Encryption Algorithm.

Department of Computer Science
Class : Msc II Sem(NEP)
Subject : R Programming
Question Bank

Unit I

1. **Write about vectors in R.**
2. **Explain different data structures in R.**
3. **Implement binary search tree with R**
4. **Explain the importance of dataframe?**
5. **Write about complex objects in R.**
6. **Write about data frame? Write about operations on data frame.**
7. **What are the data structures in R that is used to perform statistical analyses and create graphs?**

Unit II

1. **Explain different types of operators in R.**
2. **Write about control statements in R.**
3. **Write about apply method in R?**
4. **write about lapply,sapply with suitable examples?**
5. **Write about different functions for statistical distribution.**
6. **what is the use of par() function.**
7. **Write about the following with example**
    a. **Mean**
    b. **Mode**
    c. **Median**
    d. **Cumulative Sum**
    e. **Cumulative Max**
    f. **Cumulative Min**
    g. **Cumulative Product**

Unit III

1. **Write about all summary commands in R?**
2. **What is cumulative sum,product,min,max? Explain with example?**
3. **Write R functions used for this purpose?**
4. **Write about Binomial Distribution.**
5. **Write about basic math in R?**
6. **Write about plot function.**

7. **Explain dnorm() function .**
8. **Define Multiple Regression.**

Unit IV

1. **How to apply same functions to all rows and columns of a matrix? Explain with example.**
2. **Write R code to generate first n terms of a Fibonacci series**
3. **Write about sort, rank and order functions with examples. Write about functions for statistical distributions.**
4. **Explain about Finding Stationary Distributions of Markov Chains.**
5. **Write about Arithmetic and Boolean operators in R programming?**
6. **How to create user defined function in R?**
7. **How to define default values in R? Write syntax and examples?**
8. **Write about the following functions with example**
   a)points()
   b) legend()
   c)text()
   d) locator()

Department of Computer Science
Class: Msc III Sem
Subject : Software Engg
Question Bank

Unit I

1. **What is process framework ? Explain layered technology in detail.**
2. **Explain the Capability Maturity Model Integration (CMMI).**
3. **Explain functional and non-functional requirement in software engineering.**
4. **Explain waterfall model with suitable diagram.**
5. **Explain personal and team process model with suitable example.**
6. **Explain waterfall process model in detail.**
7. **Explain software engineering in terms of layered technology.**
8. **Explain software requirements document with suitable example.**
9. **what is Software ? Explain unified process with suitable example.**
10. **Explain the functional and non-functional requirement in Software Engineering.**
11. **What is process assessment ? Explain the personal and team process models.**
12. **Explain the incremental process models of Software Engineering.**
13. **What is software engineering ? Explain the generic view of software engineering as a layered**
14. **technology.**
15. **Explain the functional and non-functional requirement in software engineering.**
16. **Explain with example the personal and team process models.**
17. **Explain the incremental process models of software engineering.**

UNIT II

1. **Explain UML diagram with suitable example.**
2. **Explain an architectural design process.**
3. **What is software requirement analysis and validation ? Explain with example.**
4. **Explain with example :**
   - **(1) Data model**
   - **(2) Behavioural model.**
5. **Explain requirement in terms of elicitation and analysis.**
6. **Explain Architectural styles and pattern in detail.**
7. **Explain design process and design quality in detail.**
8. **Explain data model and object model with suitable example.**
9. **Explain the design process and design quality.**
10. **What is UML ? Explain modeling with UML.**
11. **Write short notes on :**
    - **(i) Data Model**
    - **(ii) Object Model.**
12. **What is Software requirement analysis and validation ? Explain with example.**
13. **Explain in short various phases of requirement engineering process.**
14. **Write short notes on :**
    - **(i) Data models**
    - **(ii) Object models.**
15. **Explain an architectural design process.**
16. **Explain the design process and design quality.**

UNIT III

1. **Differentiate between white box and black box testing.**
2. **Explain the user interface analysis and design.**
3. **Explain the validation testing and system testing.**
4. **Write note on object oriented design of software.**
5. **Write short notes on :**
   - **(i) System testing**
   - **(ii) Validation testing.**
6. **Explain software qualities in detail.**
7. **Explain test strategies for conventional software.**
8. **Explain user interface design in detail.**
9. **Explain :**
   - **(i) Interface analysis**
   - **(ii) Interface Design.**
10. **Explain black box and white box testing.**
11. **Explain the validation testing and system testing.**
12. **Explain the metrics for analysis model and metrics for design model.**

UNIT IV

1. **What is Risk Management ? Explain in detail.**
2. **Explain the Software Quality Assurance in detail.**
3. **Write notes on :**
   - **(1) Risk Projection**
   - **(2) Risk Refinement.**
4. **Explain the technical review and metrics for software quality in detail.**
5. **Explain statistical software quality assurance with example.**
6. **Explain projection and identification with respect to RISK.**
7. **Discuss Matrics for software quality.**
8. **Explain formal technical review with example.**
9. **Explain the risk refinement, RMMM and RMMM plan.**
10. **Explain the software quality assurance and statistical software quality assurance.**
11. **Explain the concept of software quality and software quality management. Explain the ISO 9000 quality standards.**
12. **Explain the software reliability and how to achieve it.**

Class: M.Sc. IV Sem (Computer Science)

Subject: Embedded System

QUESTION BANK

UNIT 1:

1. What are the skills required for an embedded system designer?
2. Explain architecture of PCI.
3. Explain instruction level parallelism in advanced microprocessor.
4. Explain working and functions of watch-dog timer.
5. Explain Parallel Bus communication protocol.
6. Explain the classification of Embedded System. Give the skill required for an Embedded System.
7. Explain the processor in Embedded System. Explain GPP and ASSP.
8. Explain Embedded System-On-Chip (SOC) in VLSI circuit.
9. Explain parallel bus communication protocol.
10. Explain the classification of embedded system. Give the skills repaired for an embedded system designer.
11. Write short note on: Memory Maps and addresses.

UNIT II:

1. Explain modelling of a multiprocessor system.
2. Explain serial and parallel port device drivers in a system.
3. Explain state Machine programming model for Event controlled program flow.
4. Explain the terms;
5. FSM Model
6. Use of Petri Net Model
7. Explain concept of embedded programming using Java.
8. Explain modeling of multiprocessor system.
9. Describe ISR concepts in Embedded System.
10. Explain serial and parallel port device drivers in a system.
11. Explain concept of embedded programming using C++.
12. Explain device driver programming in short.
13. Explain embedded programming using JAVA programming language.
14. Explain interrupt handling mechanism.

UNIT III:

1. Explain RTOS scheduling models.
2. Explain Thread Life Cycle for RTOS.
3. Explain process management in RTOS.
4. Explain memory management of RTOS.
5. Describe multiple processes in an application as process, task, threads and clear cut distinction between functions, ISR's and tasks.
6. Explain use of semaphores for a task and for the critical sections.

7. Explain Interprocess Communication.
8. Explain Real Time and Embedded System Operating Systems.
9. What are mailbox functions?
10. Explain RTOS Task scheduling models.

UNIT IV:

1. Explain design principle of RT Linux in detail.
2. Explain case study of embedded system design and coding for an Automatic Chocolate Vending Machine (ACVM).
3. Explain RTOS VXWORKS in detail.
4. What are the issues of Hardware/Software design for embedded system? Explain.
5. Explain pipe functions with example.
6. Explain Device Driver Programing.
7. Explain architecture of Windows CE.
8. Differentiate between Real Time and Embedded Operating system.

QUESTION BANK

MSC MATHEMATICS 1ST YEAR

SUBJECT:TOPOLOGY

1] Define - Cardinally Equivalent

2] Define- cardinal Number

3] show that the set of points in the closed interval [2,4]and in the open – interval (1,2) are cardinally equivalent.

4] The set of all integers I and the set of all rational numbers Q are equivalent .

5] The set of all integers I is countable .for by arranging the integers as0,-1,1,-2,2,-3,3,….

6]Theorem : The set of all real numbers is not enumerable i.e., R is not enumerable

7]Theorem. If a finite set of element is added to an infinite set , the power of the set is unaffected.

8] Prove $a+\alpha=\alpha$, α being any transfinite cardinal number.

9]Theorem: the power set ofany set has cardinality greater than the cardinality of the set itself.

10]Theorem: A finite product of countable set is countable.

11]Define topological space.

12]Define door space and give an example of door space.

13]Given an example to show that union of an infinite collection closed set in a topolocal space is not necessarily closed.

14]Determine whether or not each of the following intervals is a neighbourhood of 0 under the usual topology for the real line R.

15]Find the derived set of subset A={a,b,c} of X where X={a,b,c,d,e} and topology for X is given by

={X, ,{a},{c,d},{a,b,c},{b,c,d,e}}.

16] Every derived set in a topological space in closed.

17]A subset of a topological space is closed if and only if Ã=A.

18} prove that a set is closed if it contain its boundries and that is open if it is disjoint from its boundries.

19]Give an example of topological space different from the discrete space in which open sets are exactly the same as closed sets.

20]Let U be the ususal topology for R describe U-relative topology U*on the set of N of natural natural number.

21] show that the topological space(R,U)is second countable where U is usual topology .

22]To show that the discrete topology (R,D) on real line R is not second countable space.

23]Define with example of a first countable and a second countable.

24] A countable subset of space where topology has countable base. Then prove that some point of A is a limiting point A.

25]The property of being a first axion space is a hereditary property.

26]Show that every metric space is first countable.

27]The property of second axion space is a hereditary property .

28]The discrete topological space(R,D) is not separable , because the only dense subset of R is R itself but it is not countable.

29]show by means of a computer example that separability is not a hereditary property.

30]Let X and Y be topological spaces. A mapping f:X ->Y is continuous if and only if the inverse image under f of every open set in Y is open in X.

31]A mertric space is compact iff it is complete and totally bounded.

32]A subset A of a complete metric space (X,d) is compact iff A is closed and totally bounded.

33] X is second countable space then prove that any open base for X has a countable subspace which is also an open.

34]show that every discrete space is a T0-space.

35]show that the space (R,U) and (R,D)are not homeomorphic .

36]Theorem : homeomorphism is an equivalence relation in the class of topological spaces.\

37]Theorem : a topological space X is compact iff every collection of closed subsets of X with the finite intersection properties is fixed , that is ,has a non-empty intersection .

38]Theorem : if A is an infinite subset of a compact space X then A has limit point in x .

39]Theorem: The space (R,U) is not compact where U denotes the usual topology on R.

40]Define sequentially compact with example.