

FACULTY OF ENGINEERING**B.E. IV - Semester (Civil) (AICTE) (Main&Backlog) Examination, October 2021****Subject: Mathematics – III (PDE, Probability and Statistics)****Time: 2 Hours****Max. Marks: 70****(Missing data, if any, may be suitably assumed)****PART – A****Note: Answer any five questions.****(5x2 = 10 Marks)**

- 1 Form a partial differential equation by eliminating the arbitrary function f from $z = f(x^2 + y^3)$
- 2 Solve $q = xyp^2$.
- 3 Classify the partial differential equation $x^2u_{yy} - 2u_{xx} + 100u = 0$.
- 4 Solve $3\frac{\partial u}{\partial x} + 4\frac{\partial u}{\partial t}$ where $u(0,t) = 5e^{3t}$ by the method of variation of separables.
- 5 Find the variance of uniform distribution.
- 6 Determine the probability p that there are 3 defective items in a sample of 100 items if 2% of items made in a factory are defective.
- 7 Fit a straight line of the form for the following data:

x	-1	2	3
y	31	-23	-41

- 8 Show that correlation coefficient is independent of change of origin and scale.
- 9 Show that the mean of χ^2 distribution is (where n is the degrees of freedom).
- 10 State the conditions under which χ^2 test can be applied.

PART – B**Note: Answer any four questions.****(4x15 = 60 Marks)**

- 11 Using Charpit's method, solve $xp + 3yq = 2(z - x^2q^2)$.
- 12 Solve $\frac{\partial^2 u}{\partial t^2} = 16\frac{\partial^2 u}{\partial x^2}$, $0 < x < 2$, $t > 0$ subject to the conditions $u(0,t) = u(2,t) = 0$, $u(x,0) = x(2-x)$ and $\frac{\partial u}{\partial t}(x,0) = 1$.
- 13 The weekly wages of 1000 workmen are normally distributed around a mean of Rs.70 and standard deviation of Rs.5. Estimate the number of workers whose weekly wages will be
 - (i) Between Rs.69 and Rs.72
 - (ii) Less than Rs.69
 - (iii) More than Rs.72
 ($P(0 \leq z \leq 0.2) = 0.0793$, $P(0 \leq z \leq 0.4) = 0.1554$).
- 14 (a) Fit a curve of the form $y = a + bx + cx^2$ for the following data:

x	0	1	2	4
y	19	27	57	183

..2..

- (b) Let x_1, x_2, \dots, x_n be the ranks of n individuals according to a character A and y_1, y_2, \dots, y_n be the ranks of the same individuals according to other character B. Also assume that $x_i + y_i = n + 1$, for $1 \leq i \leq n$ and $(x_1, x_2, \dots, x_n), (y_1, y_2, \dots, y_n)$ are permutations of $(1, 2, \dots, n)$. Show that the value of the rank correlation coefficient between A and B is -1.

- 15 Two random samples of sizes 9 and 6 have the following values of the variable.

Sample1	15	22	28	26	18	17	29	21	24
Sample2	8	12	9	16	15	10	-	-	-

Test the difference of the estimates of the population variances at 5% level of significance. ($F_{0.05}(8,5)=4.82$).

- 16 Solve $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ subject to the conditions $u(0, y) = u(a, y) = 0, u(x, 0) = f(x)$ and $u(x, b) = 0$.

- 17 Find the correlation coefficient from the following data which shows the sales and expenses of 10 firms.

Sales X	50	50	55	60	65	65	65	60	60	50
Expenses Y	11	13	14	16	16	15	15	14	13	13

FACULTY OF ENGINEERING

B.E. IV - Semester (EE/Inst/CSE) (AICTE) (Main&Backlog) Examination,

October 2021

Subject: Mathematics – III (Probability and Statistics)

Time: 2 Hours

Max. Marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

- 1 State Baye's theorem.
- 2 A random variable X has the following probability distribution:

X:	1	2	3	4
P(X):	1/10	1/5	3/10	2/5

Find the mean of the distribution.

- 3 Average number of accidents on any day on a national highway is 1.8. Find the probability that the number of accidents is at least one.
- 4 Define Skewness of a distribution.
- 5 Write any two properties of the normal probability curve.
- 6 Find the variance of the uniform distribution.
- 7 Two lines of regression are $7x - 16y + 9 = 0$, $5y - 4x - 3 = 0$. Find \bar{x} and \bar{y} .
- 8 Define type I and type II errors.
- 9 Write the assumptions for conducting t-test.
- 10 Explain briefly F-test.

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

- 11 (a) State and prove theorem of total probability.

(b) A continuous random variable X has the pdf $f(x) = \begin{cases} ax^3, & 0 \leq x \leq 1 \\ 0 & \text{elsewhere} \end{cases}$.

Find (i) a (ii) $P\left(X < \frac{1}{4}\right)$ and (iii) $P\left(X > \frac{1}{2}\right)$.

- 12 (a) Fit a binomial distribution to the following data:

x:	0	1	2	3	4	5
f:	2	14	20	34	22	8

- (b) Calculate the first four moments about the mean for the following data:

x:	1	2	3	4	5	6	7	8	9
f:	1	6	13	25	30	22	9	5	2

- 13 (a) The marks obtained in Mathematics by the students in a class are approximately normally distributed with mean 62 and variance 36. If 3 students are selected at random, find the probability that at least one of them would score more than 80 marks.
- (b) Find the mean and moment generating function of exponential distribution.

..2..

14 (a) Find the least square line $y = a + bx$ for the following data:

$x:$	-2	-1	0	1	2
$f:$	1	2	3	3	4

(b) Intelligence test of two groups of boys and girls gave the following results.

Girls: $\bar{x}_1 = 84$, S.D. = 10, $n_1 = 121$

Boys: $\bar{x}_2 = 80$, S.D. = 14, $n_2 = 81$.

Is the difference between the standard deviations significant? Test at 5% level of significance.

15 The values of two random samples are given below.

Sample A 15 25 16 20 22 24 21 17 19 23

Sample B 35 31 25 38 26 29 32 34 33 27 29 31

Can we conclude that the two samples are drawn from the same population? Test at 5% level of significance.

16 (a) A dice is thrown twice and the sum of the numbers appearing is noted to be 8. Find the probability that the number 5 has appeared at least once.

(b) Find the variance of the normal distribution.

17 From the following data, calculate coefficient of correlation between X and Y and the two lines of regression equations.

X:	1	2	3	4	5	6	7	8	9
Y:	12	11	13	15	14	17	16	19	10

FACULTY OF ENGINEERING

B. E. IV – Semester (AICTE) (ECE/M/P/AE) (Main&Backlog) Examination,

October 2021

Subject: Industrial Psychology

Time: 2 Hours

Max. Marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

1. Mention the TYPES OF ORGANIZATIONS.
2. Draw the ORGANIZATIONAL CHART for your college.
3. Indicate the METHODS of MOTIVATION.
4. What is the difference between FATIGUE and BOREDOM?
5. Mention three factors responsible for high MORALE in INDUSTRY.
6. What is meant by CONSUMER PREFERENCE?
7. Write about effects of ILLUMINATION in Industry.
8. Is NOISE in Industry Beneficial?
9. What is WORK EFFICIENCY CURVE?
10. What is the significance of TIME and MOTION study in an Industry?

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

11. (a) State the various TYPES of ORGANIZATIONS and compare an contrast between “LINE” and “STAFF” type of an organization.
(b) What do you understand by the classical, “Neo Classical” and “Modern Theory” of an organization? Compare them.
12. (a) How is an employee be motivated? Can there be NEGATIVE motivation? What is JOB SATISFACTION?
(b) Are MORALE of an employee and ABSENTISM connected? Explain.
13. (a) Define FATIGUE, BOREDOM and ACCIDENTS. Are they inter linked, Explain?
(b) What is JOB SPECIFICATION? Explain the process of Employee selection.
14. (a) How do you classify CONSUMERS? Do they behave similar in the purchase of Groceries Versus a Refrigerator? Explain.
(b) Among the channels available for ADVERTISING, say TV, Radio, News Paper, Cinema hall which one will you choose for advertising (i) A new Fertilizer (ii) A new motor cycle? Explain.

15. (a) What do you understand by the terms TIME and MOTION study? Write about their advantages and disadvantages.
- (b) What are the factors which influence workers efficiency at a work place? What are the effects of Noise and Pollution at a work place?
16. (a) What are ACCIDENTS? Classify them. Can they be prevented? What is SAFETY? Write in detail.
- (b) What is JOB DESIGN? What are the HUMAN FACTORS effecting job design?
17. Write short notes on:
- (a) Organization chart of your college
 - (b) Consumer preference
 - (c) Allowances in TIME and MOTION STUDY
 - (d) Staff Organization Versus Matrix Organization.

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FACULTY OF ENGINEERING**B.E. IV - Semester (AICTE) (CME) (Main) Examination, October 2021****Subject: Operating System Concepts****Time: 2 Hours****Max. Marks: 70****(Missing data, if any, may be suitably assumed)****PART – A****Note: Answer any five questions.****(5x2 = 10 Marks)**

- 1 Define the following terms:
(i) Throughput (ii) Waiting time (iii) Turnaround time.
- 2 Define necessary conditions for deadlock occur.
- 3 Distinguish between Thread and Process.
- 4 Define Semaphore and its operations.
- 5 What is hardware abstraction layer?
- 6 What is Critical Section?
- 7 Define Internal and External Fragmentation.
- 8 List any five common file types in Unix.
- 9 Write about Implementation of Access Matrix.
- 10 Write short notes on Inter Process Communication.

PART – B**Note: Answer any four questions.****(4x15 = 60 Marks)**

- 11 (a) What is PCB? Explain the purpose of PCB.
(b) Discuss threading models.
(c) Explain multi-level feedback queue scheduling algorithm.
- 12 Find average waiting time and average turn around time for the following example in
(i) FcFs, (ii) RR (Time slice = 3M), (iii) SJF and (iv) SRTF.

Process	Burst Time	Arrival Time
P1	25	0
P2	28	2
P3	8	4
P4	4	6

- 13 (a) Explain classical problems of synchronization.
(b) Explain Banker's Algorithm for deadlock avoidance.
- 14 Explain disk-scheduling algorithms with an example.
- 15 (a) Explain DMA.
(b) Explain segmentation with a neat diagram.
- 16 (a) How process management is performed in LINUX? Explain.
(b) Explain the architecture of WINDOWS – XP.
- 17 Explain briefly Windows7-Design principles.

FACULTY OF ENGINEERING**B.E. (I.T) (AICTE) IV – Semester (Main & Backlog) Examination, October 2021****Subject: Database Systems****Time: 2 Hours****Max. Marks: 70****(Missing data, if any, may be suitably assumed)****PART – A****Note: Answer any five questions.****(5x2 = 10 Marks)**

- 1 List out the advantages of DBMS approach.
- 2 Discuss the Database Characteristics.
- 3 Define the various Mapping Cardinalities.
- 4 Compare BCNF and 3NF.
- 5 Differentiate between dense and sparse indices.
- 6 Sketch the state diagram of a Transaction.
- 7 Implement the **alter** and **drop** command with the help of an example.
- 8 List the division operation with an example.
- 9 Define Nested Queries.
- 10 Define Trigger. Give example.

PART – B**Note: Answer any four questions.****(4x15 = 60 Marks)**

- 11 a) List out the various database users.
b) Explain the three schema architecture and data independence in detail.
- 12 a) Describe briefly about the various extended ER features.
b) State Functional Dependency and give its types.
- 13 a) Discuss the concept of "Conflict serializability" with an example.
b) Construct B⁺-tree for the following keys when n = 4: 2, 3, 5, 7, 11, 17, 19, 23, 29, 31.
- 14 a) Discuss the various integrity constraints over relations.
b) Define all the variations of Join Operation in Relational Algebra.
- 15 Explain the concept of NULL values in SQL.
- 16 Define Lock based protocol and explain Two-Phase Locking Protocol.
- 17 Discuss the following topics:
 - a) File System Organization
 - b) Multilevel Indexes
 - c) Mobile Database.

FACULTY OF ENGINEERING**B.E. 2/4 (Civil) II-Semester (Backlog) Examination, October 2021****Subject: SURVEYING-II****Time: 2 hours****Max. Marks: 75****Note: Missing data, if any, may be suitably assumed.****PART – A****Note: Answer any seven questions.****(7x3 = 21 Marks)**

1. List the fundamental lines of theodolite
2. State different cases of trigonometric levelling.
3. How do you adjust the traverse by transit rule?
4. State the principle of substance bar.
5. Distinguish between fixed hair method and movable hair method of stadia tachoemetry.
6. Define sight distance along a sag vertical curve?
7. What do you understand by a Compound curve?
8. What is tacheometry? State its main purpose.
9. State any three functions of total stations.
10. Mention applications of GIS in Surveying?

PART – B**Note: Answer any three questions.****(3x18 =54 Marks)**

11. (a) List out the errors in theodolite surveying. Explain one by one in detail.
(b) How do you measure horizontal angle by reiteration method?
12. (a) Explain different parts of a theodolite with figure.
(b) Distinguish between loose needle and fast needle method of traversing.
13. (a) Two straights BA and BC are intersected by a line EF. The angles BEF and BFE are 140° and 145° respectively. The radius of the first arc is 600m and that of the second is 400m. Find the chainages of the tangent points, and the point of compound curvature, given that the chainage of point A is 3415 m.
(b) What is meant by Elements of Transition curve?
14. (a) How do you set a simple curve by offsets from long chord?
(b) The vertical angles to vanes fixed at 1.5m and 3.5m above the foot of the staff held vertically at a station as $+2^{\circ} 30'$ and $+6^{\circ} 30'$ respectively. Find the horizontal distances and the R.L of A, if the instrument axis is +430.500 m.

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15(a) The following are the lengths and bearings of the sides of a closed traverse ABCDA.

Line	Latitude in m	Bearing
AB	76.80	S 39° 48' E
BC	195.60	N 36° 24' E
CD	37.20	N 21° 12' W

Determine fore bearing and back bearings

(b) List out different types of Total Station? Also write the applications of Total Station.

16(a) Explain the components of GIS with a sketch showing its in block diagram.

(b) A tacheometer fitted with an analytic lens was set up at a station. A and the following readings were obtained on a vertically held staff. R.L. of B.M was 100.00 Calculate the horizontal distance AB and R.L. of B.

Station	Staff	Vertical angle	Hair reading
A	B.M	-2° 18	1.500, 1.800, 2.450
A	B	+8° 36	0.750, 1.500, 2.250

17 Write short notes on any TWO of the following:

- (a) Electronic Theodolite
- (b) Beaman's stadia
- (c) Gale's Traverse.

FACULTY OF ENGINEERING**B.E. 2/4 (EEE/EIE) II-Semester (Backlog) Examination, October 2021****Subject: Solid Mechanics****Time: 2 hours****Max. Marks: 70****Note: Missing data, if any, may be suitably assumed.****PART – A****Note: Answer any seven questions.****(7x3 = 21 Marks)**

1. Define longitudinal strain, lateral strain and Poisson's ratio.
2. Draw BMD for a cantilever beam of length 3m subjected to a UDL of 9kN/m over 2 m from its free end.
3. State Hooke's law.
4. Sketch the shear stress distribution due to shear force, V kN, at a rectangular cross-section.
5. A cantilever beam of 6m is subjected to UDL of 10kN/m throughout the span. Find maximum slope and deflection.
6. State assumption made in the theory of simple bending.
7. A closed coil helical spring is required to carry a load of 150N. If the mean coil diameter is to be 8 times that of the wire, calculate these diameters. Take maximum shear stress as 100N/mm^2 .
8. Define Torsional stiffness and Modulus of Rupture.
9. What do you understand by Transmission of power?
10. Enumerate the applications of Strain energy.

PART – B**Note: Answer any three questions.****(3x18 =54 Marks)**

- 11(a) A steel bar 50mm wide, 2mm thick and 300mm long is subjected to an axial pull of 84 kN. Find the changes in the length, width, thickness and the volume of the bar. Take $E=2 \times 10^5 \text{ N/mm}^2$ and Poisson's ratio=0.32.
(b) Write in detail about relationship between elastic constants.
12. A Cantilever 2m long is loaded with a uniformly distributed load of 2kN/m run over a length of 1m from the free end. It also carries a point load of 4kN at a distance of 0.5m from the free end. Draw the Shear force Diagrams and Bending Moment diagrams.
13. The cross section of a beam is a T-section having flange 120mmx10mm and web 10mmx150mm. Calculate the shearing stresses induced in the beam section due to a shear force of 90kN. Also sketch the shear stress distribution across the section of beam.
14. Derive the Pure Torsion equation. $\frac{T}{J} = \frac{C\theta}{l} = \frac{fs}{r}$

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- 15(a) A closed coiled helical spring is to carry a load of 500N, its mean coil diameter is to be 10 times that of the wire diameter. Calculate these diameters if the maximum shear stress in the material is to be 80N/mm^2
- (b) Calculate the strain energy in a bar 3m long & 40mm in diameter when it is subjected to a tensile load of 100kN, if the load is applied (i) Gradually (ii) Suddenly.
- 16(a) A beam AB of 4 m span is loaded with a central point load of 60kN. The section of the beam is a rectangle 150mm wide and 300mm deep. At a cross-section distant 2 m from support, calculate shear stress at a distance of 40mm from neutral axis.
- (b) Find the maximum torque that can be safely applied to a shaft of 80 mm diameter. The permissible angle of twist is 1.5 degree in a length of 5m & shear stress is not to exceed 42MPa. Take Shear modulus=84GPa.
- 17 A beam of length 8m is simply supported at the ends. It carries a udl of 40kN/m as shown in figure 1. Determine the deflection of the beam at its mid-point. Also find the maximum deflection. Take $E= 2 \times 10^5 \text{ N/mm}^2$ and $I=4.3 \times 10^8 \text{ mm}^4$

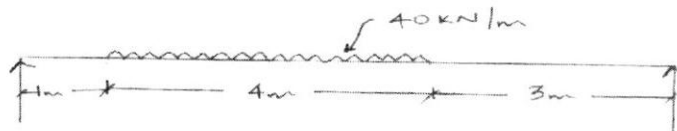


Figure 1

FACULTY OF ENGINEERING**B.E. 2/4 II-Semester (ECE) (Backlog) Examination, October 2021****Subject: Analog Electronic Circuits****Time: 2 hours****Max. Marks: 75****Note: Missing data, if any, may be suitably assumed.****PART – A****Note: Answer any seven questions.****(7x3 = 21 Marks)**

1. Draw small signal model at high frequency of FET?
2. What is cascading of amplifier stages? What is the advantage?
3. Compare negative feedback and positive feedback?
4. Write about the effect on input and output impedences of trans-resistance amplifier with negative feedback?
5. What are the applications of oscillators?
6. Draw symbol and electrical equivalent circuit of a Crystal?
7. What is class-D operation? What is its efficiency?
8. Why cross-over distortion occurs in power amplifiers?
9. What are the features of RF voltage tuned amplifiers?
10. Compare single tuned and double tuned RF voltage amplifiers?

PART – B**Note: Answer any three questions.****(3x18 = 54 Marks)**

11. For a single stage transformer coupled BJT amplifier, derive gain at mid and low frequencies?
12. (a) Evaluate the effect of negative feedback on bandwidth of amplifier?
(b) Draw circuit of voltage series negative feedback amplifier and derive expression for its gain?
13. Explain working of RC phase shift FET oscillator and derive expressions for frequency of oscillation and condition of oscillation?
14. Draw circuit diagram and explain working of transformer coupled class AB push pull power amplifier and find efficiency?
15. For a critically coupled double tuned RF voltage amplifier, obtain expressions for gain at resonance and bandwidth?
- 16 (a) Write about local and global feedback?
(b) Explain staggering in RF voltage amplifiers. What is the advantage of staggering?
- 17 Write short notes on:
 - (a) Interacting and non-interacting amplifier stages
 - (b) Stability of oscillators
 - (c) Class-D operation.

FACULTY OF ENGINEERING**BE 2/4 II-Semester (M/P) (Backlog) Examination, October 2021****Subject: Fluid Dynamics****Time: 2 Hours****Max marks: 75****Missing data, if any, may be suitably assumed****PART - A****Note: Answer any seven questions.****(7x3 = 21 Marks)**

1. State and express Newton's law of viscosity
2. Differentiate between laminar and turbulent flow
3. Classify pressure measurement devices
4. What are the properties of stream function?
5. List out the engineering applications of Bernoulli's theorem
6. Name the different forces present in a fluid flow
7. Express the Hagan – Poiseuille's equation and mention its use
8. A crude oil of kinematic viscosity 0.4 stoke is flowing through a pipe of diameter 300mm at the rate of 300 liters/s. Find the head lost due to friction for a length of 50m of the pipe. Take friction factor $f=0.00591$.
9. Define the terms: Boundary layer and boundary layer thickness
10. Derive the continuity for one dimensional compressible flow.

PART - B**Note: Answer any three questions.****(3x18=54 Marks)**

11. a) Define the terms: i) Surface tension, ii) Capillarity
 b) A 40cm diameter shaft is rotating at 200 rpm in a bearing of length 120mm. If the thickness of oil film is 1.5 mm and the dynamic viscosity of the oil is 0.7Ns/m^2 . Determine: (i) Torque required overcoming friction in bearing; (ii) Power utilization in overcoming viscous resistance.
12. a) Differentiate between stream function and velocity potential function
 b) A 40cm diameter pipe, conveying water, branches into two pipes of diameters 30cm and 20cm respectively. If the average velocity in the 40cm pipe diameter pipe is 3m/s. Determine the discharge in this pipe. Also calculate the velocity in 20cm pipe if the average velocity in 30cm diameter pipe is 2 m/s.
13. a) Obtain Bernoulli's equation from Euler's equation of motion. State all assumptions made.
 b) A pipe of 0.25m diameter carries oil of specific gravity 0.8 at the rate of 125 liters/s the pressure at point A is 19.62 KN/m^2 (gauge). If the point A is 3.5 m above the datum line. Calculate the total energy at point A in meters of oil.

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14. a) Express the relation and its importance of Reynolds number.
b) A pipe of diameter 20cm and length 10,000m is laid at a slope of 1 in 200. An oil of Specific gravity = 0.9 and $\mu = 1.15$ poise is pumped up at the rate of 20 litres per second. Find the head lost due to friction. Also find the power required to pump the oil.
15. a) Explain the concept of boundary layer theory across a flat plate.
b) A small pipe line 10cm in diameter and 1000m long carries water at the rate of 7.5 lts/sec. If the kinematic viscosity of water is 0.02 stokes, calculate the head lost wall shearing stress, centerline velocity, shear stress and velocity at 4cm from centerline and thickness of the laminar sub layer.
16. Find the Mach number when a aeroplane is flying at 1100 km/hr through still air having a pressure of 7 N/cm² and temperature of -5°C. Wind velocity may be taken as zero. Take $k=1.4$, $R=287$ J/kg °k. Also calculate the pressure, temperature and density of air at stagnation point on the nose of the plane.
17. Write a short notes on
- Use of flow nets
 - Simple U-tube manometer
 - Compressible and incompressible flow

FACULTY OF ENGINEERING**B.E. 2/4 II-Semester (AE)(Backlog) Examination, October 2021****Subject: Fluid Mechanics and Machinery****Time: 2 hours****Max. Marks: 75****Note: Missing data, if any, may be suitably assumed.****PART – A****Note: Answer any seven questions.****(7x3 = 21 Marks)**

1. Define Surface Tension?
2. Differentiate between piezometer and pressure guage?
3. Define Uniform flow and Steady flow.
4. Name the different forces present in a fluid.
5. What is the difference between pitot tube and pitot static tube?
6. What do you mean by Viscous flow?
7. Explain loss of head due to bend in pipe?
8. Define Mechanical Efficiency and Volumetric efficiency?
9. What is the difference between Kaplan turbine and propeller turbine?
10. Explain ideal indicator diagram?

PART – B**Note: Answer any three questions.****(3x18 =54 Marks)**

11. Explain and derive the expression for U-tube differential manometer for two pipes at same level and at different levels.
12. A 45 cm pipe is conveying water branches into two pipes of diameter 25 cm and 15 cm respectively. If the average velocity in the 45 cm pipe is 3m/s find the discharge in this pipe. Also determine the velocity in the 15cm pipe if the avg velocity in 25 cm pipe is 2m/s.
13. The water is flowing through a taper length 100m having diameter 600mm at the upper end and 300mm at the lower end at the rate of 50lit/sec. The pipe has a slope of 1 in 30. Find the pressure at the lower end if the pressure at the higher level is 19.62 N/cm².
14. A crude oil of viscosity 0.97 poise and relative density 0.9 is flowing through a horizontal circular pipe of diameter 120mm and length 12m. Calculate the difference of pressure at the two ends of the pipe, if 100kg of the oil is collected in a tank in 30 seconds.
15. Explain the working construction of Kaplan turbine with neat sketch? Draw the inlet and outlet velocity triangles.
16. (a) Define Specific speed of centrifugal pump. Derive Expression for the same.
(b) Draw and discuss Main characteristic curves of centrifugal pumps.
- 17(a) Compare the differences between Centrifugal pumps and Reciprocating pump.
(b) Explain the working of Vane pump with neat sketch?

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) II-Semester (Backlog) Examination, October 2021

Subject: Object Oriented Programming using Java

Time: 2 hours

Max. Marks: 75

Note: Missing data, if any, may be suitably assumed.

PART – A

Note: Answer any seven questions.

(7x3 = 21 Marks)

1. Why is java called as “robust”?
2. How are data and functions organized in object are oriented programming?
3. Under which contexts do you use “final” and “finalize”
4. What is difference between a thread & a process?
5. Differentiate between string & string buffer.
6. When should you use equals in Java.
7. What is annotation in java?
8. Differentiate Text field and Text area.
9. What method is used to read a byte from System.in?
10. What is Stream? Give an example.

PART – B

Note: Answer any three questions.

(3x18 =54 Marks)

- 11.(a) Explain the usage of java packages.
(b) Write a java program to demonstrate.
(i) Access a package (ii) Adding a class to package.
- 12 Illustrate with an example the throw statement by manually throwing an arithmetic exception.
- 13(a) Give the two restrictions applied to enumerations.
(b) Discuss how primitive types are converted into objects and vice versa with an example.
- 14(a) What is event handling. Explain steps involved in it.
(b) Discuss about checkbox group with a program.
- 15(a) Write a program to read an array of bytes from the keyboard.
(b) What are java’s type wrapper classes? What is their use?
- 16(a) Explain the use of ‘Event listeners’ in Java
(b) How do you restrict access to an object to one thread at a time?
- 17 Write a recursive program that displays the contents of a string backwards.

FACULTY OF ENGINEERING
B.E. II/IV II - Semester (IT) (Backlog) Examination, October 2021

Subject: OOP Using JAVA

Time: 2 Hours

Max. Marks: 75

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any seven questions.

(7x3 = 21 Marks)

- 1 What is the use of Packages?
- 2 What is the difference between applets init () and start () method?
- 3 List different methods in Thread class.
- 4 Differentiate between Vector and Array List.
- 5 What does the following statement prints?
System. Out. Println ("ab" +2+3);.
- 6 Does Java support multiple inheritance?
- 7 Distinguish between object and class.
- 8 What are the uses of final keyword in Java?
- 9 What are the two ways of creating threads in Java?
- 10 Define Package.

PART – B

Note: Answer any three questions.

(3x18 = 54 Marks)

- 11 (a) Write a java program to copy a text file to another text file. Read source and destination file names from command line.
(b) What is the difference between String and stringbuffer class? Explain with example.
- 12 Write a Java program for handling key board events.
- 13 Explain with an example Java program the use of super keyword in Java.
- 14 (a) Explain Interfaces concept. Give examples.
(b) Explain super keyword with example program explain different addressing modes.
- 15 (a) Explain the basic concept of object oriented programming.
(b) What is an array? How arrays are declared and initialized? Explain with example.
- 16 (a) Explain about Border Layout and Grid Layout.
(b) Write a program to create an interface for a desk top calculator with a text box to display the results and various buttons to click.
- 17 Write short notes on:
 - (a) String Tokenizer
 - (b) Event Listener Interfaces
 - (c) Checked Exceptions.

FACULTY OF ENGINEERING**B E IV - Semester (CBCS) (Civil) (Backlog) Examination, October 2021****Subject: Fluid Mechanics - II****Time: 2 Hours****Max marks: 70****Missing data, if any, may be suitably assumed****PART - A****Note: Answer any five questions.****(5x2=10 Marks)**

1. Differentiate between Laminar and Turbulent flow
2. What is the significance of Reynolds number?
3. Explain water hammer effects briefly.
4. Find the maximum discharge for least excavation of a rectangular channel having 3m width. If $C=60$ and bed slope is $1/1200$.
5. Define the term boundary layer separation
6. What are the fundamental concepts of Drag and Lift forces?
7. What is critical velocity of flow in an open channel?
8. Derive the equation for momentum thickness of a boundary layer
9. State under what conditions a hydraulic jump can occur
10. Illustrate the significance of Froude number.

PART - B**Note: Answer any four questions.****(4x15=60 Marks)**

- 11.a) Derive Hagen Poiseuille's equation for laminar flow through circular pipes
- b) A main pipe divides into two parallel pipes of 0.8m and 0.5m diameter with equal lengths. Parallel pipes meet again at the lower end. Find the discharge in each parallel pipe, if the discharge in the main pipe is $2.5\text{m}^3/\text{sec}$. The coefficient of friction for each parallel pipe is same.
- 12.a) Water flowing in a long pipe is suddenly stopped by closing a valve at the discharge end. The diameter of the pipe is 160 mm and its thickness is 7 mm. The quantity of water flowing in the pipe is 20 lit/sec. Find the rise of pressure due to instantaneous closure of valve at the discharge end. Take modulus of elasticity of the pipe material as $1.962 \times 10^5 \text{ N/mm}^2$ and bulk modulus of water as $1.962 \times 10^3 \text{ N/mm}^2$.
- b) Classify pipes based on different pipe materials. Also write briefly about pipe leakages.

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- 13.a) A smooth flat plate 2.4 m long and 0.9m wide moves length wise at 6 m/s through still atmospheric air of density 1.226 kg/m^3 and kinematic viscosity $1.49 \times 10^{-5} \text{ m}^2/\text{s}$. Assuming the boundary layer to be entirely laminar, calculate the boundary layer thickness at the trailing edge of the plate, the shear stress half-way along the plate and the power required to move the plate.
- b) Define boundary layer and explain the fundamental causes of its existence. Also discuss the various methods of controlling the boundary layer?
- 14.a) A V-shaped open channel carries the water at a rate of $0.1 \text{ m}^3/\text{sec}$ when depth of the water is 1.2 m and each side of channel is inclined at 45° to the horizontal. Find the slope of the channel along the flow direction if $C=50$.
- b) Derive the equation for Critical depth and specific energy of an Open channel with neat sketch.
- 15.a) Find the slope of free water surface in a rectangular channel having width 20m, depth 5m and discharge $50 \text{ m}^3/\text{sec}$. If the bed slope of the channel is $1/4000$ and Chezy's constant is 60.
- b) Explain in detail the significance of velocity and pressure distribution in open channel flow.
- 16.a) Derive the momentum equation for a jump in horizontal rectangular channel. Also explain what do you understand by energy dissipation in hydraulic jumps.
- b) Write in detail about direct step method
17. Write notes on any two of the following
- Sudden valve closure
 - Flat plate and Aerofoil
 - Most efficient channel sections
 - Surges in Open channel

FACULTY OF ENGINEERING

B.E. (EEE/EIE) IV-Semester (CBCS) (Backlog) Examination, October 2021

Subject: Linear Integrated Circuits

Time: 2 hours

Max. Marks: 70

Note: Missing data, if any, may be suitably assumed.

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

1. Name the different methods used in fabrication of integrated circuits.
2. Write the applications of Voltage to current and current to voltage convertor.
3. What is Schmitt trigger and also mention its applications.
4. Draw multiplier and divider circuit diagrams.
5. Mention the applications of instrumentation amplifier.
6. What is the main drawback of dual slope of ADC?
7. Draw the pin diagram of 555 timer.
8. Compare Linear voltage regulator and Switching regulator.
9. Define cut-off frequency for the filter.
10. Why we require high pass filter?

PART – B

Note: Answer any four questions.

(4x15 =60 Marks)

11. Explain the DC characteristics of ideal OP-Amp.
12. (a) Explain the operation of a positive clamper by drawing necessary waveforms.
(b) Draw and explain the operation of difference Amplifier.
13. (a) Explain quadrature Oscillator with neat circuit diagram.
(b) Explain the operation of a triangular waveform generator with neat diagram.
14. (a) Write short notes on 555 timer with op-amp.
(b) Design square wave oscillator for a frequency of 2 KHz using op-amp.
15. With neat simplified internal diagram, explain the working principle of Operational trans-conductance Amplifier.
16. (a) Explain the working principle of Monostable with relevant circuit diagrams.
(b) Explain band reject filters using Op-Amp.
17. Derive the equation for H_{HP} H_{LP} H_{BP} and H_N from a universal filter.

FACULTY OF ENGINEERING

B.E. IV-Semester (ECE) (CBCS)(Backlog) Examination, October 2021

Subject: Pulse Digital and integrated Circuits

Time: 2 hours

Max. Marks: 70

Note: Missing data, if any, may be suitably assumed.

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

1. Define RC time Constant Circuit.
2. Define Sweep Error.
3. What are the methods of generating a time base waveform?
4. Draw the transfer characteristics of clamper.
5. Compare the different logic families.
6. Write characteristics of IC?
7. What are the merits and demerits of TTL logic?
8. Define multivibrator and their types?
9. Calculate the gate width of a Monostable multivibrator $R=10K$ and $C=10\mu f$.
10. Define Comparator and its applications.

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

- 11.(a) Explain about RLC circuit.
(b) State and explain Clamping Circuit theorem.
- 12.(a) With the help of neat circuit diagram, explain the working of a two level Clipper?
(b) Give the circuit of different types of shunt clipper and explain their operation with the help of their transfer characteristics?
- 13(a) Derive the expression for Displacement error.
(b) Explain the operation of emitter coupled logic.
- 14(a) Explain the operation of Tristate TTL circuit.
(b) Draw and explain 2 inputs TTL NOR gate.
- 15(a) Draw a TTL NAND gate and explain its operation.
(b) Design a CMOS transistor circuit that has the functional behaviour
 $F(z) = A.(B + C)$
- 16(a) Explain the operation of A stable multivibrators and draw waveforms.
(b) Explain the need of the attenuator
17. Write short notes on (a) DTL (b) Comparison between TOTEM Pole and Open Collector Output.

FACULTY OF ENGINEERING**B.E.IV Semester (Mech./Prod.)(CBCS) (Backlog) Examination, October 2021****Subject: Basic Electronics****Time: 2 hours****Max. Marks: 70****Note: Missing data, if any, may be suitably assumed.****PART – A****Answer any five questions.****(5x2 = 10 Marks)**

- 1 Define Hall effect and drift currents.
- 2 What is meant by doping? Why it is necessary for semiconductors?
- 3 What are the advantages of JFET over Bipolar transistor?
- 4 If the voltage gain of an amplifier without feedback is 60dB. It decreases to 40dB with feedback. Calculate the feedback factor.
- 5 Mention applications of CRO.
- 6 Give the general expression for LC Oscillator.
- 7 What is the difference between RC and LC oscillators?
- 8 Draw the diagram for full wave and half wave rectifier.
- 9 Write the application of Strain gauge.
- 10 Draw V-I characteristics of JFET.

PART – B**Answer any four questions.****(4x15 = 60 Marks)**

- 11 (a) What is an ideal diode? How can it be represented a switch? Draw its equivalent circuit and its V – I characteristics.
(b) Draw and explain the operations of Zener diode regulator.
- 12 Explain in detail the input and output characteristics of CE, CB & CC configuration.
- 13 (a) Explain RC phase shift Oscillator.
(b) Draw a neat sketch of Crystal Oscillator and explain its operation.
- 14 (a) Draw an example the block diagram of typical OP-Amp.
(b) What are universal gates? Give their logical circuits and truth table.
- 15 Explain working of LVDT. Derive gauge factor.
- 16 (a) Differentiate Avalanche and Zener breakdown.
(b) Explain how transistor works as an amplifier.
- 17 (a) The reverse saturation current of silicon PN junction diode is $15 \mu\text{A}$. Calculate the diode current for the forward bias voltage of 0.55 volts at 25°C .
(b) How Avalanche and Zener breakdown occur in PN junction diode? Explain in detail.

FACULTY OF ENGINEERING

B.E. IV-Semester (CBCS) (AE) (Backlog) Examination, October 2021

Subject: Automotive Chassis Components

Time: 2 hours

Max. Marks: 70

Note: Missing data, if any, may be suitably assumed.

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

1. What is a semi-forward chassis?
2. What is the advantage of an integral frame system?
3. Explain Caster and Camber angles with simple figures.
4. What are the components of a driveline in an automobile?
5. Explain the non-slip differential used in cars.
6. What are the various housings used for rear axles?
7. What are the different loads acting on the rear axles in an automobile?
8. What do you understand by independent suspension system?
9. Define a coil spring and its design features.
10. What is the function of a master cylinder in the application?

PART – B

Note: Answer any four questions.

(4x15 =60 Marks)

- 11(a) Explain the advantages and disadvantages of using a semi-integral framework in automobiles.
(b) Explain the ladder type of frame with a diagram.
12. Explain the constructional features of a chassis, briefly explaining the different systems that are fixed on it.
13. What do you understand by a double reduction and twin speed drives? Explain in detail.
- 14.(a) Explain the fully-floating and three-quarter floating rear axle systems.
(b) With the help of neat sketch explain the working of torsion bar.
- 15(a) What is an independent suspension system? Mention the different parts of independent suspension system.
(b) Explain the working of a brake system, and also classify different brake systems used in automobiles.
- 16 Explain the working of a parking brake system with a neat sketch.
- 17(a) What is a universal joint? Where is it used in an automobile?
(b) What do you understand by an antilock brake system?

FACULTY OF ENGINEERING

B.E. (CSE) IV-Semester (CBCS) (Backlog) Examination, October 2021

Subject: Computer Organization

Time: 2 hours

Max. Marks: 70

Note: Missing data, if any, may be suitably assumed.

PART – A

Answer any five questions.

(5x2 = 10 Marks)

- 1 What is Virtual memory? What are its advantages?
- 2 List the types of data hazards.
- 3 What is instruction level parallelism?
- 4 Why does the DMA priority over CPU when both request memory transfer?
- 5 What is the function of program counter, instruction register and micro instruction?
- 6 Explain about Direct memory access and indirect memory access.
- 7 How super computers differ from Micro computer?
- 8 What are the differences between hardwired and micro programmed control units?
- 9 List out the types of interrupts.
- 10 Draw a diagram to illustrate the interrupt cycle.

PART – B

Answer any four questions.

(4x15 = 60 Marks)

- 11 (a) Explain fixed point representation with examples.
(b) Explain the interconnection structure for multiprocessor system.
- 12 (a) Discuss in detail about Read and write operation with timing diagram.
(b) Explain Booth's Algorithm with an example and draw flow chart.
- 13 (a) Explain instruction Cycle with flow chart and example.
(b) Draw the diagram of 4-bit arithmetic circuit with four full-adder circuits with 4-bit address and four multiplexers for choosing different operations.
- 14 Write short notes on :
 - (a) Modes of transfers
 - (b) Daisy chaining priority
 - (c) RISC VS CISC
- 15 With a neat sketch explain the working principle of DMA.
- 16 (a) Briefly explain the functioning of magnetic discs.
(b) Explain CPU performance and its factors.
- 17 What is cache memory, explain a mechanism of data transfer between cache and main memory?

FACULTY OF ENGINEERING

B.E. IV - Semester (IT) (CBCS) (Backlog) Examination, October 2021

Subject: Scripting Languages

Time: 2 Hours

Max. Marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer any five questions.

(5x2 = 10 Marks)

- 1 What are the uses of scripting languages?
- 2 Discuss the origin of scripting.
- 3 Define python versions 3.X.
- 4 What are the data types in python list?
- 5 What are the uses of break?
- 6 Write a python script to display "Hello World".
- 7 Define Sets.
- 8 Mention any four built-in functions.
- 9 Write a statement to close a file named "f1".
- 10 Illustrate with statement with an example.

PART – B

Note: Answer any four questions.

(4x15 = 60 Marks)

- 11 (a) What are the characteristics of scripting languages?
(b) List types of scripting languages and what are the uses of each scripting languages.
- 12 Discuss python operations with an example program.
- 13 (a) Define Dictionaries. Explain function calling with example.
(b) What is strings and string operations?
- 14 Illustrate indexing and slicing operations on lists with examples.
- 15 (a) Discuss file and read positions in python.
(b) Explain the python file object methods.
- 16 Give the syntax of "Open" function. Write a python program to write and read a file.
- 17 (a) Define Python. Discuss history language features.
(b) What are the operations in python? Explain each with example.
