Code No.14045

FACULTY OF ENGINEERING

BE 2/4 II – Semester (Backlog) Examination, March / April 2021

Subject: Strength of Materials-II

Time: 2 hours **Max. Marks: 75**

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

PART – A

Answer any seven questions. **(7x3 = 21 Marks)**

1. What is static external indeterminacy of a fixed beam?
2. Explain the concept of shear centre.
3. State Clapeyron's theorem of three moments.
4. Define Modulus of resilience and proof resilience
5. Find the slope at the free end of a cantilever beam of span 'l' subjected to a clockwise couple 'M' at its free end.
6. Differentiate between elastic prop and rigid prop
7. Define conjugate beam. How is the bending moment of conjugate beam related to the real beam?
8. State the theorem of reciprocal deflection.
9. Calculate the maximum deflection of a fixed beam of span 4m due to a central point load of 80KN. EI = 20000 KN-m^2
10. Write Secant formula to calculate the maximum compressive stress in a long column subjected to an eccentric load and explain the parameters in it.

PART – B

Answer any three questions. **(3x18 = 54 Marks)**

11. A simply supported beam of span 8m is subjected to a point load of 40 KN at 3m from left support and a uniformly distributed load of 10KN/m over a length of 3m from right support. Determine the deflection under the point load and slope at left support. EI=30000 KN-m^2

12. Calculate the deflection at the free end of the cantilever beam shown in fig1. by conjugate beam method.

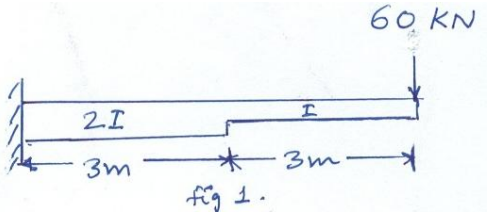

fig 1.

13. A fixed beam of span 8m carries two point loads of 80KN and 120 KN acting at 2m from each support. Calculate the fixed end moments and sketch the bending moment and shear force diagrams.

14. Analyse the continuous beam ABCD shown in fig2. by using three moments equation and sketch SFD and BMD.

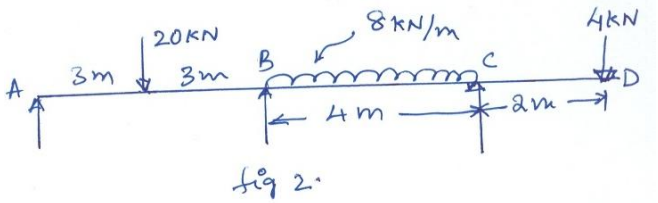

fig 2.

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15. Find the forces in all the members of the truss shown in fig3. using tension coefficient method.

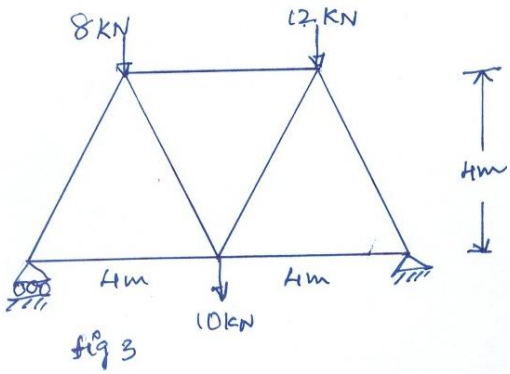

fig 3

16. A closely coiled helical spring has mean coil diameter equal to 8 times of wire diameter. If the permissible shear stress and deflection under a load of 240 N are 60N/mm^2 and 50mm respectively, calculate the number of coils and the wire diameter. C = 100 GPa.

17. A hollow circular column of 150mm external diameter and 120mm internal diameter is 4m long and both ends are fixed. Calculate the Rankine's safe load on the column. f = 520N/mm^2, α = 1/1600 and Factor of safety is 3.

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Code No: 14051

FACULTY OF ENGINEERING

B.E. II/IV (EEE) II-Semester (Backlog) Examination, March/April 2021

Subject: Electrical Circuits – II

Time: 2 hours **Max. Marks: 75**

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

PART – A

Answer any seven questions. **(7x3 = 21 Marks)**

1. An exponential voltage V(t) = $16e^{-4t}$ volts is applied to series RC circuit with R = 1Ω and C=0.4F.
   Find the response i(t) assuming initial charge to be zero.

2. Obtain the impulse response of RL series circuit.

3. Using the initial and final value theorems where they apply, find $f(0^+)$ and $f(\infty)$ for the flowing function $F(S) = \frac{(S+1)(S+2)}{(S+3)(S+4)}$.

4. Find the inverse Laplace transform of $I(s) = 2log\left(\frac{s+2}{s}\right)$

5. Determine the impedance parameters of the Two Port network shown in Fig.1.

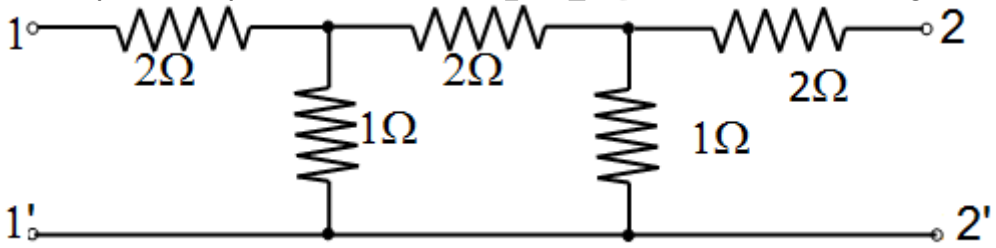

Fig.1

6. When a network is said to be symmetrical and reciprocal with respect to transmission parameters?

7. Obtain even and odd pats of the given function shown in Fig.2 and plot these two.

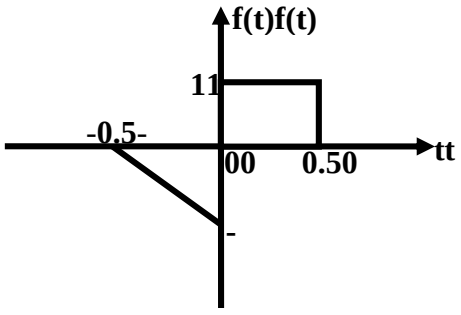

Fig.2

8. Define half-wave symmetry in Fourier series.

9. Verify whether the given polynomial is Hurwitz or not.
   $P(s) = s^6 + 3s^5 + 8s^4 + 18s^3 + 37s^2 + 75s + 50$

10. Define transfer function and write its limitations.

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PART – B

Answer any three questions. **(3x18 = 54 Marks)**

11. Derive the expression for transient response in an RC series circuit excited by a DC source. Find the time constant and maximum value of stored energy with R = 10Ωand C = 20μF for a series RC circuit excited by a 50V DC supply.

12. A ramp voltage 3 (t-2) is applied in a series RC circuit at t = 0 where R = 5Ω and C =2F. Assuming zero initial conditions, Find i(t).

13. Determine the impedance, admittance, parameters for the network shown in Fig. 3.

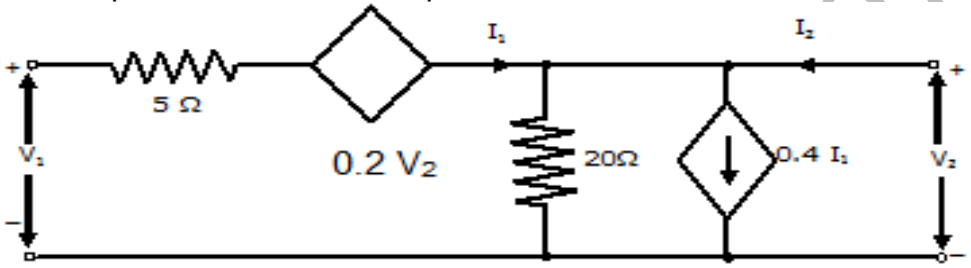

Fig.3

14. Find the trigonometric Fourier series of a rectified full sine wave.

15. Realize $Z(s) = \frac{s(s^2+2)(s^2+4)}{(s^2+1)(s^2+3)(s^2+5)}$ in Cauer First and Second form.

16. For the RC network shown in Fig. 4b is energized with an input voltage shown in Fig. 4a. Find i(t).

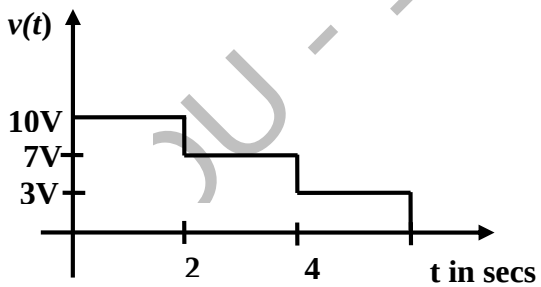

Fig. 4a

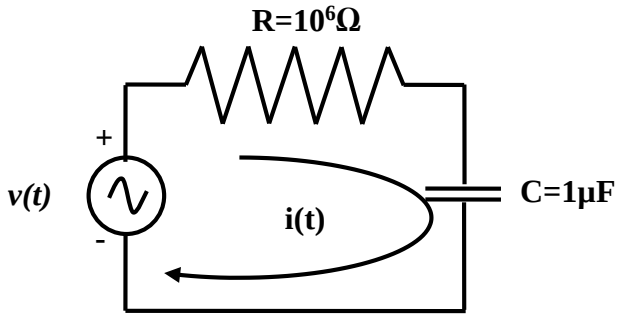

Fig.4b

17. Synthesize the network function $Z(s) = \frac{s\,(s^2+4)}{2(s^2+1)(s^2+3)}$ using Foster forms.

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Code No. 14057

FACULTY OF ENGINEERING

B.E. 2/4 (Inst.) II – Semester (Backlog) Examination March / April 2021

Subject : Transducer Engineering

Time : 2 hours **Max. Marks : 75**

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

Part – A

Note: Answer any seven questions. ***(7 x 3 = 21 Marks)***

1. A pressure measurement instrument is calibrated between 20 bar and 260 bar then what is the scale span?
2. Define Linearity.
3. Explain the working of Potentiometer.
4. Write the application of Strain Gauge.
5. Explain about Capacitive Proximity Transducer.
6. Explain the working Principle of RVDT.
7. Describe about Standards for calibration of Temperature.
8. What is a Thermal Conductivity Gauge?
9. Write a short note on Force balance Transducer.
10. Explain in General how pressure is measured with Electrical Transducer as a Secondary Transducer.

Part – B

Note: Answer any three questions. ***(3 X 18 = 54 Marks)***

11. a) Distinguish between Static and Dynamic characteristics of an instrument.
    b) Obtain the expression for Ramp response of first order system of an instrument.

12. With a neat diagram explain the Principle and working of Strain Gauge also Derive expression for Gauge Factor of a Strain Gauge.

13. With a neat diagram explain the construction and working Principle of Capacitive Transducer used for measurement of Displacement.

14. a) With a neat diagram explain the working of Resistance Temperature Detector.
    b) Explain the operation of Liquid in glass filled Thermometer.

15. a) With a neat diagram explain the operation f Diaphragm.
    b) With a neat diagram explain the operation of Ionization Gauge.

16. a) With a Schematic diagram explain about Dead Weight Gauge.
    b) Explain about the classification of Transducers.

17. Write short notes on
    a) Capacity Hygrometer
    b) Basic Requirement of Transducer
    c) IC Temperature sensor

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Code. No: 14059

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) II-Semester (Backlog) Examinations, March/April 2021

Subject : Probability Theory and Stochastic Processes

Time : 2 Hours **Max. Marks: 75**

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

PART – A

Note: Answer any Seven Questions **(7x3 = 21Marks)**

1 Define "Random Variable". Give an example.
2 If X is a uniformly distributed Random Variable between 2 and 8, find the variance of X.
3 Discuss Chebychev's inequqlity.
4 State and explain the relation between characteristic function and the n^{th} ordinary moment of a random variable X.
5 Discuss Joint moments about the origin and correlation of two random variables X and Y.
6 Define joint characteristic function of two random variables X and Y.
7 Explain the terms : Stationary random process and Ergodic random process.
8 Discuss normality of a random sequence.
9 Distinguish between White noise and colour noise.
10 Define the characteristic function of a random sequence.

PART – B

Note: Answer any Three Questions **(3x18 = 54Marks)**

11 A coin is tossed three times. The outcomes Heads and Tails are represented by 0 and 1 respectively. The outcomes of the coin are added to form a random variable S. Find $f_S(s)$, mean and Variance of S.

12 The probability density function of an exponentially distributed random variable is given by $f_X(x) = 0.2\, e^{\frac{-x}{5}}\, u(x)$. Find a) $F_X(x)$ b) $E(X)$ and c) Variance of X.

13 a) X is an exponentially distributed random variable with $f_X(x) = a\, e^{-ax}\, u(x)$. If Y = 2X find the mean of Y.
b) Derive an expression for the mean and variance of a binomial distributed random variable.

14 a) Define and explain Central limit theorem.

b) The joint density of two random variables are given by $F_{X,Y}(x,y) = 2\, e^{\left[-\left(4y+\frac{x}{2}\right)\right]}.u(x)u(y)$ Find the marginal density of X.

15 a) Explain non-linear mean-square estimation.
b) Explain the generation of random number sequence with an exponential distribution.

16 a) Derive an expression for the output random variable Y in terms of the input random variable X and impulse response of a linear system h(t).
b) The power spectral density of a RC low-pass filter is given by $S_{XX}(\omega) = \frac{N_0}{2}\ -\infty \leq \omega < \infty$. Find the power spectral density of output random variable Y .

17 Write short notes on the following :
a) Bernouli's trials.
b) Applications of Random numbers.
c) Mean square estimation.

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Code No. 14065

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/A.E./CSE) II-Semester (Backlog) Examination, March/April 2021

Subject : Mathematics - IV

Time: 2 hours **Max. Marks: 75**

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

PART – A

Answer any seven questions. **(7x3=21 Marks)**

1 Evaluate $\int_0^{2+i} (\bar{z})\,dz$ along the line $y = \frac{x}{2}$.

2 Evaluate using Cauchy's integral formula $\oint_C \frac{e^{2z}}{(z+i)^4}\,dz$ where C is the circle |z| = 3.

3 Find the nature and location of singularity of $f(z) = \frac{z - \sin z}{z^2}$.

4 Obtain the expansion $\frac{z-1}{z^2}$ is a Taylor series in powers of (z - 1) and determine the region of convergence.

5 Determine $z[(n+1)^2]$.

6 State the convolution theorem for z-transform.

7 Find Fourier cosine transform of $f(x) = \begin{cases} \cos x, & 0 < x < a \\ 0, & x \geq a \end{cases}$

8 Find Fourier sine transform of $f(x)=e^{-x}$.

9 Perform three iterations of Newton Raphson method to find the root of the equation $x = \sqrt{5}$.

10 Construct divide difference table for the following data:

x	0	1	4	5	6
f(x)	1	14	15	6	3

PART – B

Answer any three questions. **(3x18 = 54 Marks)**

11 (a) Find the analytic function whose real part is e^{-x} ($x\sin y - y\cos y$).

(b) Derive polar form of Cauchy-Reimann equations.

12 (a) Expand in Laurent's series of $f(z) = \frac{7z^2 - 9z - 18}{z^3 - 9z}$ is the region |z| > 3.

(b) Find the bilinear transformation which maps the points z = 1, i, -1 into the points w = 0, 1, ∞.

13 (a) Evaluate $z^{-1}\left\{\frac{z^2}{(z-1)(z-3)}\right\}$ using convolution theorem.

(b) If $U(z) = \frac{2z^2 + 5z + 14}{(z-1)^4}$ evaluate u_2 and u_3.

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14 Find the Fourier transform of $f(x) = \begin{cases} 1 - x^2, & |x| \le 1 \\ 0, & |x| > 1 \end{cases}$.

Hence evaluate $\int_0^\infty \left(\frac{x \cos x - \sin x}{x^3} \right) \cos\left(\frac{x}{2} \right) dx$.

15 (a) Using Lagrange interpolation find the interpolating polynomial for the following data, and hence find f(2) value.

x	1	3	4
y=f(x)	1	27	64

(b) Find the $f'(6)$ from the following data:

x	6	8	10
f(x)	25.3	16.7	13.0

16 (a) Use Runge Kutta method of order four to compute $y(0.2)$ and $y(0.4)$ from $10\frac{dy}{dx} = x^2 + y^2, y(0) = 1$, take h = 0.2.

(b) Using Residue theorem evaluate $\oint_C \frac{e^{2z}}{(z+2)(z+4)(z+7)} dz$ where

C : | z | = 3.

17 (a) Solve $y_{n+2} + 6y_{n+1} + 9y_n = 2^n \quad with \quad y_0 = y_1 = 0$ using z-transforms.

(b) Use Euler's method to find $y(0.2)$, $y(0.4)$ from $y' = y + e^x$, $y(0) = 0$, take h = 0.2.

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Code No.14077

FACULTY OF ENGINEERING

B.E. 2/4 (IT) II-Semester (Backlog) Examination, March/April 2021
Subject : Probability and Random Processes

Time: 2 hours **Max. Marks: 75**

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

PART – A

Answer any seven questions. **(7x3=21 Marks)**

1 If P(A) = $\frac{3}{5}$, P(B) = $\frac{2}{5}$, P(A∩B) = $\frac{1}{5}$ Determine P(A/B) and P(B/A).
2 State and prove Baye's theorem.
3 Determine the characteristic function of binomial distribution.
4 State Poisson theorem.
5 Determine the density of random variable Z = $\frac{X}{Y}$.
6 If X and Y are independent variables prove that E(Y/X) = E(Y).
7 Define the distribution and density function of a random process X(t).
8 Suppose that X(t) is a WSS process with mean μ(t)=3 and ACF
$R(t_1,t_2) = 9+4e^{-0.2|t_1-t_2|}$ Determine the mean and variance of R∪Z = X(5), W = X(8)
9 State the properties of Gaussian process
10 Define White noise

PART – B

Answer any three questions. **(3x18 = 54 Marks)**

11 a) State and prove addition theorem of probability of 'n' events.
b) There are 4 boxes. Box1 contains 2000 components with 5% defective Box2 contains 5000 components with 40% defective. Boxes 3 and 4 contain 1000 each with 10% defective. We select at random one of the boxes and remove a component. What is the probability that the selected component is defective

12 a) The density function of RV 'X' is defined as follows

$f(x) = ax \quad 0 \le x \le 1$
$= a \quad 1 \le x \le 2$
$= 3a-ax \quad 2 \le x \le 3$
$= 0$ else where

Determine (i) The value of a
(ii) The Distribution function of 'X'

b) Determine the density of Y=2X-3 given, the pdf of 'X' f(x) = $\frac{x}{12}$ for 1<x<5 = 0 else where

13 a) If the joint pdf of x,y is given by $f_{xy}(x,y) = x + y$ $0 \le x,y \le 1$. Determine the pdf of U=XY
b) Sate the properties of Joint distribution function

14 a) Verify the process X(t) = A cos λ t + B sin λ t for wide-sense stationary where A and B are RVs if i) E(A) = E(B)=0 ii) $E(A^2) = E(B^2)$ and iii) E(AB)=0
b) State the properties of power spectral density

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15 a) Suppose customers arrive at a bank according to a poisson process with a mean rate per minute. Determine the probability that during a time interval of 2 minutes
i) exactly 4 customers arrive ii) More than 4 customers arrive

b) Determine the ACF of White noise. Draw the low pass and band pass representations White noise.

16 a) A fair die is rolled 10 times. Determine the probability that f_1 shows three times, and 'even' shows six times

b) A fair coin is tossed 10000 times. Determine the probability that the number of heads are between 4900 and 5100 using Normal approximation.

17 a) Write the expressions for conditional density and conditional mean of random variables X and Y

a) The ACF of a WSS random process X(t), $R(t) = a^2 e^{-2r(t)}$. Determine its power spectral density.

b) Write the expressions for mean and variance of Poisson process.

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Code No. 14557/CBCS

FACULTY OF ENGINEERING

B.E. (Civil) IV-Semester (CBCS) (Backlog) Examination, March / April 2021

Subject : Strength of Materials – II

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 Explain briefly the Moment area method for finding deflection of beams.

2 Using Double Integration method find the deflection of a cantilever beam at its mid-point, if it is loaded with a Concentrated load of 'W' kN at is free end.

3 A propped cantilever of span 6m is loaded with udl of intensity 15 kN/m over entire span. Find the prop reaction.

4 Write the equation of theorem of three moments for a two span continuous beam with one of the exterior end is fixed and other as simply supported.

5 A solid circular shaft of diameter 100 mm, 2 m long is fixed at one end and free at the other end. It is subjected to a Torque of 10 kN m at its free end. Find the angle of twist, if Modulus of Rigidity is 50 GPa.

6 What is the difference between open coiled spring and close coiled spring.

7 Define the terms Static and Kinematic indeterminacy of structures.

8 State and explain Castigalino's theorem-I.

9 Explain the term analogous column.

10 What is the difference between a column and a strut.

PART – B

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

11 a) Using Conjugate Beam method, find the deflection of points 'B' and 'C' of the simply supported beam shown in fig.(1).

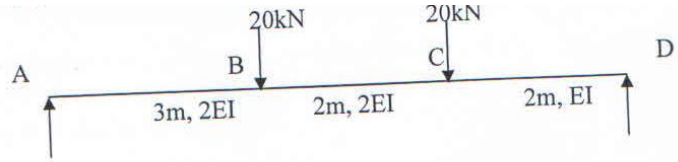

Fig.(1)

12 Analyse the fixed beam shown in the fig.(2) and draw the S.F. and B.M diagrams.

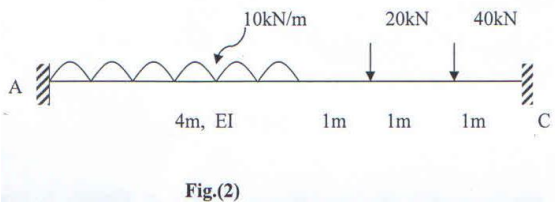

Fig.(2)

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13 Analyse the continuous beam shown in fig. (3) by theorem of three moments and draw its B.M.D.

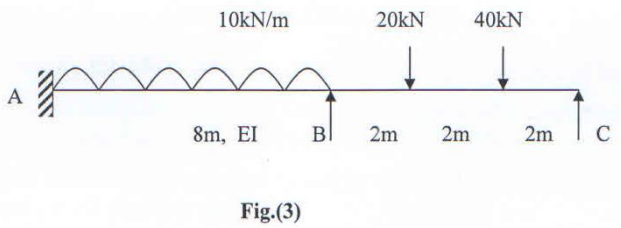

Fig.(3)

14 a) Develop the Torsion equation and discuss its assumptions and limitations.

b) A close coiled helical spring, having 120 mm mean diameter and 12 mm diameter of coil have 15 turns. The spring is subjected to an axial pull of 400N. Determine the maximum shear stress in the coil of the spring and the maximum deflection of the spring. Take G = 8×10^4 N/mm^2.

15 a) Define the terms strain energy and resilience. What are their significance?

b) A weight of 500 N falls through a height of 600 mm on a collar of a suspended hollow steel bar of external diameter 75 mm and internal diameter 50 mm. The length of the bars is 3 m. Determine the stress induced in the bar and also find the maximum deformation. Take E = 200 GPa.

16 Using column analogy method find the stiffness and carry over factor for a fixed beam of span 6 m. The moment of inertia of left half of the beam is three times that of the right half.

17 a) Derive the Euler's Equation for the buckling load of slender column whose one end is fixed and other end is hinged.

b) Using Euler's equation of crippling load, find the load carrying capacity of a solid circular column of diameter 200 mm, 5 m long and fixed at both ends.
Take E = 2.1×10^5 N/mm^2.

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Code No.14564/CBCS/S

FACULTY OF ENGINEERING

B. E. (EE/Inst.) (CBCS) IV – Semester (Backlog) Examination, March/April 2021

Subject: Power 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. The reverse recovery time of a diode is *trr* = 10 µS, and the rate of fall of the diode current is di/dt = 80µS. If the softness factor is SF = 0.5, determine peak reverse current. I_{RR}.
2. Why n-channel enhancement power MOSFETs are preferred in Power Electonics?
3. Why pulse triggering is preferred over RC triggering?
4. Define the following figures of merit. (i) THD (ii) TUF.
5. Discuss the effect of load inductance on firing angle control of 1-ϕ ac voltage controller.
6. Give an expression for three-phase full-converter for a delay angle of 60^0.
7. Derive Boost converter current gain expression.
8. Why step-up cyclo-converters require forced commutation?
9. List the advantages of PWM control.
10. What is multi level Inverter?

PART – B

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

11. (a) Explain the working with neat structure of an n-channel power MOSFET and plot its output characteristics.
    (b) Draw and explain two transistor analogy of SCR.

12. (a) Compute RC & UJT – triggering methods of an SCR with a circuit diagram.
    (b) Draw and explain dynamic characteristics of SCR.

13. (a) Discuss about gate drive considerations of Power switching devices.
    (b) Distinguish punch through and non-punch through IGBT with neat construction diagrams.

14. Discuss the effect of source inductanc on 1-ϕ fully-controlled bridge converter feeding an inductive load with the associated wave forms for continuous conduction. Derive the expression for average load voltage, average load current.

15. (a) A Step-down chopper has a resistive load of R = 10Ω and input voltage V_{dc} = 200V. When the chopper is turned on, the voltage drop across switch is 2V, the chopper frequency is 1 kHz. For a duty cycle of 40%, determine (i) average output voltage (ii) the RMS output voltage (iii) efficiency of the chopper.
    (b) Explain the operation of a 1-ϕ AC voltage controller with RL-load.

16. (a) Explain 120^0 conduction mode of 3-phase inverter.
    (b) Brief about Pulse width modulation techniques of Inverters.

17. Write short notes on:
    (a) Circulating current mode of single-phase dual converter.
    (b) Single-phase mid-point type step-down cyclo-converter with RL-load. Assume continuous conduction.

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Code No. 14573 / CBCS

FACULTY OF ENGINEERING

B.E. (ECE) IV – Semester (CBCS) (Backlog) Examination, March / April 2021

Subject: Analog Electronic Circuits

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 are the advantages and disadvantages of Transformer coupled Amplifier?
2 Draw high frequency pi-model of BJT and give typical values of parameter.
3 What is the effect of negative current series feedback on R_i and R_o of amplifier?
4 What are the characteristics of negative feedback?
5 Classify amplifiers based on location of Q-point.
6 Explain class-D operation.
7 State and explain Barkhausen criteria for oscillations.
8 For a Crystal L=0.4H, C=0.05pf, C`=2pf and R=6kohm. Find series and parallel resonant frequencies and quality factor.
9 What is Staggered tuned amplifier? What is its advantage?
10 What are the characteristics and applications of RF tuned voltage amplifier?

PART – B

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

11 For a single stage RC coupled FET amplifier derives expressions for mid-band gain, lower cutoff frequency and upper cutoff frequency.

12 For the circuit shown, find R_{MSF},A_{VSF}, R_{if} & R_{of}. Given h_{fe}=100, h_{ie}=1Kohm, h_{re}= h_{oe}=0.

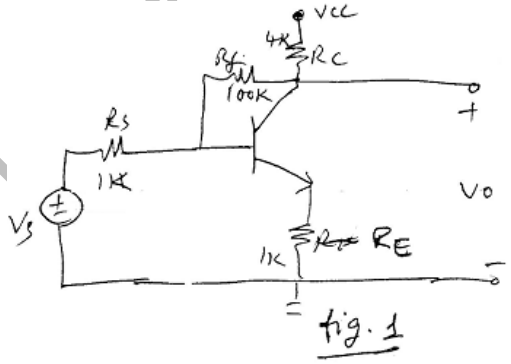

fig. 1

13 Explain the operation of hartly oscillator. Derive expressions for condition of oscillation and frequency of oscillations.

14 a) Prove that efficiency of class-B power amplifier is 78.6%.
b) What is cross-over distortion in class-B power amplifier? How it can be eliminated?

15 For a double tuned RF voltage amplifier obtain expressions for gain at resonance and bandwidth.

16 a) Derive relations between h-parameters and pi-parameters of BJT.
b) Write about stability of feedback amplifiers.

17 Writ short notes on any two of the following:
a) Transistorized series regulator.
b) Design considerations of class-A power amplifier.
c) Neutralization and uni-laterization in RF voltage amplifiers.

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Code. No. 14577/CBCS

FACULTY OF ENGINEERING

B.E. (M/P) (CBCS) IV-Semester (Backlog) Examination, March/April 2021

Subject : Electrical Circuits and Machines

Time: 2 Hours **Max. Marks: 70**

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

PART – A

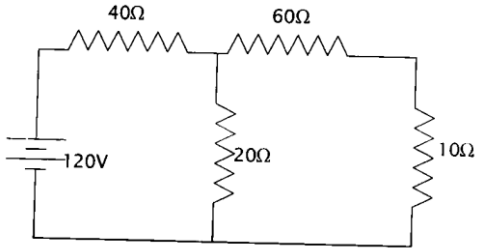
Note: Answer any Five Questions **(5x2 = 10Marks)**

1. Distinguish between Network and Circuit?
2. A Circuit is made of 150Ω bulb and a 120Ω rheostat in series across 100V Supply. Solve voltage across rheostat and Bulb
3. Explain the Principle of Transformer?
4. What are advantages of using 3-phase system over single – phase system?
5. State the principle of DC Generator.
6. List the application of DC Motor
7. List out the advantages of 3-phase Induction Motor?
8. Why starting torque of slip-ring Induction Motor is high?
9. Compare Alternator and Induction Generator
10. Define about single phase Motors. What are its Types?

PART – B

Note: Answer any Four Questions **(4x15 = 60Marks)**

11. a) State and explain Norton's Theorem
    b) Using Norton's theorem evaluate the current in 10Ω Resistor



12. a) Three coils each having a resistance of 20Ω and inductive reactance of 15Ω is connected in star to a 400V, 3-phas 50Hz supply. Evaluate a) Line current b) Power factor c) Power absorbed and draw the phasor diagram
    b) State the advantages and disadvantages of star and delta connected system

13. a) Derive the emf equation of DC Generator?
    b) The armature of an 8-pole DC Generator has wave winding containing 664 conductors. Evaluate the generated voltage when flux/pole is 0.08wb, speed is 210 r.p.m. At what speed should the armature be driven to generate 500V if flux /pole is made 0.06 wb.

14. a) Explain Torque-slip characteristics of 3-phase Induction motor?
    b) Derive the torque equation for 3-phase Induction Motor?

15. a) Derive Emf equation of Alternator?
    b) Discuss the construction of 3-phase Alternator?

16. a) Derive the relation to find the condition for maximum efficiency in the Transformer
    b) Explain methods of starting squirrel cage Induction Motor?

17. a) A Capacitor when in series with a 145Ω resistor has a circuit impedance of 208Ω. Solve a) The size of Capacitor b) The power c) Impedance d) The power factor when circuit is connected to 130, 60Hz source.
    b) Explain about the speed control methods of DC shunt Motor

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Code No. 14583/CBCS

FACULTY OF ENGINEERING

B.E. IV-Semester (CBCS) (A.E) (Backlog) Examination, March/April 2021

Subject : Automotive Petrol Engines

Time: 2 Hours **Max. Marks: 70**

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

PART – A

Note: Answer any Five Questions **(5x2 = 10Marks)**

1. Draw the port timing diagram of 2 stroke petrol engine and indicate the cyclic processes.
2. Define compression ratio and what is its limit for petrol engine?
3. Draw a neat sketch of simple carburetor.
4. Draw a layout of MPFI system.
5. What is the use of primary and secondary windings in ignition coil?
6. Draw a neat sketch of spark plug and indicate its parts/
7. What is abnormal combustion in SL engines?
8. Draw a neat sketch for different types of combustion chambers
9. Define the viscosity index.
10. What are the applications of water-cooling system?

PART – B

Note: Answer any Four Questions **(4x15 = 60Marks)**

11. a) Draw a neat sketch of 4 stroke petrol engine and explain the working principle.
    b) Derive an equation for mean effective pressure of Otto cycle.

12. a) Explain why a rich mixture is required for stating, idling and acceleration of S.I engine.
    b) Differentiate between constant vacuum and constant choke carburetor.

13. a) With a suitable sketch explain the working principle of magneto ignition system..
    b) Differentiate between centrifugal and vacuum advance mechanism.

14. a) What are factors to be considered for designing a good combustion chamber?
    b) Define flame front propagation and list on what parameters it depends.

15. a) List the components of I.C. engines which requires lubrication. What are its objectives?
    b) With a suitable sketch explain wet sump lubrication system.

16. a) What is the effect of compression ratio on efficiency of Otto cycle? Explain in detail.
    b) Explain how a carburetor meets the quick acceleration requirement

17. a) Explain the phenomenon of knocking in S.I. Engine.
    b) What are the objectives of cooling system?

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Code No.14587/CBCS

FACULTY OF ENGINEERING

B. E. (CSE) IV – Semester (CBCS) (Backlog) Examination, March/April 2021

Subject: Signals & System Analysis

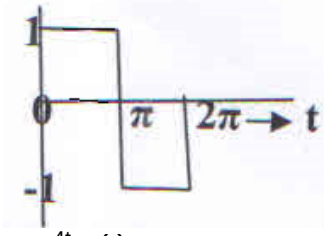
Time: 2 Hours **Max. Marks: 70**

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

PART – A

Note: Answer any Five Questions **(5x2 = 10Marks)**

1. What is meant by closed set or complete set for the general functions?
2. What is the fourier transform of $\hat{x}(t)$?
3. Show that the function shown in fig is orthogonal to cos nt over the interval 0 to 2π.



4. Find the Fourier transform of $f(t) = e^{-4t}\,u(t)$.
5. What is Time Invariant system?
6. Check whether the system $y(t) = x(t^2)$ is linear or not?
7. What is Convolution?
8. Find the convolution of x(n)={1,2,3,4} and h(n)={2,3,4,5} using non-graphical method.
9. Differentiate Fourier transform and Z-transform
10. Define R.O.C.

PART – B

Note: Answer any Four Questions **(4x15 = 60Marks)**

11. (a) Explain the analogy between vectors and signals.

    (b) Approximate the function f(t)=1; 0 to π with sin rt over 0 to 2π in such a way its MSE is minimum. -1; π to 2π

12. (a) State and prove any four properties of Fourier transform.

    (b) Find the Fourier transform of $e^{3t}u(-t)$ and plot its spectrum.

13. (a) Check whether the system $y(t)=x^2(t)$ are linear or not and Time Invariant or not.

    (b) Explain Casual system with example.

14. (a) Perform convolution operation using graphical method for x(n)={1,-2,3,5} and h(n)={3,4,-1,6}.

    (b) Define auto correlation. State and prove any two properties.

15. (a) Find the Z-transform for $x(n)=(1/2)^n u(n)+(1/3)^n u(n)$ and plot its pole-zero locations.

    (b) Determine the inverse Z-transform for $X(z)=z(z-1)/(z+1)(z+2)^2$; ROC: |z|>2.

16. (a) Explain poly-Weiner criterion for physical realization.

    (b) State and prove any three properties of Hilbert transform.

17. (a) Differentiate auto correlation and cross correlation.

    (b) What are the properties of convolution?

    (c) State and prove Parseval's energy theorem.

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Code No. 14593/CBCS

FACULTY OF ENGINEERING

BE IV Semester (CBCS)(I.T) (Backlog) Examination, March/April 2021

Subject: Computer Organization & Micro Processor

Time: 2 Hours **Max. Marks: 70**

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

PART – A

Note: Answer any Five Questions **(5x2 = 10Marks)**

1) Differentiate microprocessor & micro controller.
2) Give the significance of DAA with example.
3) Define memory access time, Bus Cycle.
4) Write the expression of processor average execution time with the presence of two cache memories .
5) Interprete the function of SIN, SOUT flag in the interface circuit.
6) Write any two limitations of 8085 microprocessor.
7) Write a Program to perform Subtraction of two 8-bit numbers using 8085.
8) Differentiate master mode, Slave mode operation of DMA.
9) Draw the memory hierarchy.
10) Explain the Significance of Bit Set/Reset mode of 8255.

PART – B

Note: Answer any Four Questions **(4x15 = 60Marks)**

11) Analyze the Instruction set of 8085 in detail.

12) (a) Explain the direct mapping methods in cache memory with example.
(b) Write about virtual memory.

13) (a)Write an 8085 program to add two 16-bit numbers.
(b) Write about any four addressing modes of 8085 with example for each.

14) How a Keyboard/Display Controller (8279) can be interfaced to 8085, analyze it in detail?

15) Draw the block diagram of IEEE488, Classify all the blocks of it in detail.

16) What is the difference between A/D & D/A Conversion? Explain how an A/D converter can be interfaced to 8085?

17) Write short notes on any two of the following.
(i) 8255 functions
(ii) PSW of 8085
(iii) DMA

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Code No.15066/AICTE

FACULTY OF ENGINEERING

B. E. (ECE / MP / AE / IT) IV – Semester (AICTE) (Backlog) Examination,

March / April 2021

Subject: Essence of Indian Traditional Knowledge

Time: 2 hours **Max. Marks: 70**

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

PART – A

Note: Answer any five questions. **(5 x 2 = 10 Marks)**

1. Explain the nature of Philosophy?
2. Write a note on Indian Culture?
3. What is “Sunyavada”?
4. Explain the Philosophical Ideas the role of Sanskrit.
5. Religion. Explain.
6. Brahma Samaj – Explain.
7. Indian handicrafts – Explain in brief.
8. Non-Violence-its importance.
9. Explain the Vedic education system?
10. Education and social justice – Explain in brief.

PART – B

Note: Answer any four questions. **(4 x 15 = 60 Marks)**

11. (a) Discuss the common characters of Indian Philosophy?
    (b) What is the relation between culture and civilization.
12. (a) Discuss about the visistadvaita and Advaitavedanta?
    (b) Write an essay on Literature of South India?
13. (a) Critically examine the ethics of Jainism?
    (b) Religion and Society – Discuss.
14. (a) Explain the Indian painting and Indian Architecture?
    (b) What are the divisions of Indian Classic Music?
15. (a) Discuss the role of Education in social change.
    (b) Explain the development of Science and Technology in India?
16. (a) Write an essay on the life of Goutham Buddha?
    (b) Explain the views of Gandhiji on “Satyagraha”.
17. (a) Explain the NEP – National Education Policy – 2020.
    (b) Explain about Education on the lines of Jainism and Buddhism?

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FACULTY OF ENGINEERING

B.E. (CE/EE/EIE/CSE) (AICTE) IV – Semester (Backlog) Examination, March/April 2021

Subject: Effective Technical Communication in English

Time: 2 hours **Max. Marks: 70**

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

PART – A

Note: Answer any five questions. **(5 x 2 = 10 Marks)**

1 How can you achieve brevity in technical writing?

2 What do you mean by jargons?

3 Mention the names of any two formats used for drafting business letters.

4 Write any two differences between a business letter and business memo.

5 What do you mean by product manual?

6 Why do you need to avoid redundancy in preparing a manual?

7 What do you mean by progress report?

8 Explain two means to achieve objectivity in preparing a report.

9 Explain any two advantages of E-mail.

10 How can visual aids enhance technical communication?

PART – B

Note: Answer any four questions. **(4 x 15 = 60 Marks)**

11 a) Write a note on the importance of subject competence and linguistic competence for effective technical communication?
b) Discuss the various oral forms of technical communication.

12 a) Assume that you are Mala Waghle, the sales promotion officer of LG. Draft a sales letter promoting the sales of LG air conditions to the prospective customers. You may include the following offers:
Free gift
0% finance
Scratch the LG lucky coupon.
b) Write brief notes on the following topics:
i) Formal and non-formal business proposals
ii) Solicited and unsolicited business proposals

13 a) Discuss the various kinds of reports. Give an example of each.
b) Sigma Educational Institute is considering a proposal to open a branch in Kothapet, Hyderabad. As a Regional Manager you need to prepare a feasibility report on the prospects of opening the branch in the area. In writing the report, you may consider the competitive advantage, expenses, profitability glitches etc.

14 a) Write a note on the different kinds of manuals.
b) Imagine you are launching a new mobile phone KALL ME. Design a set of instructions for a user manual to use the product.

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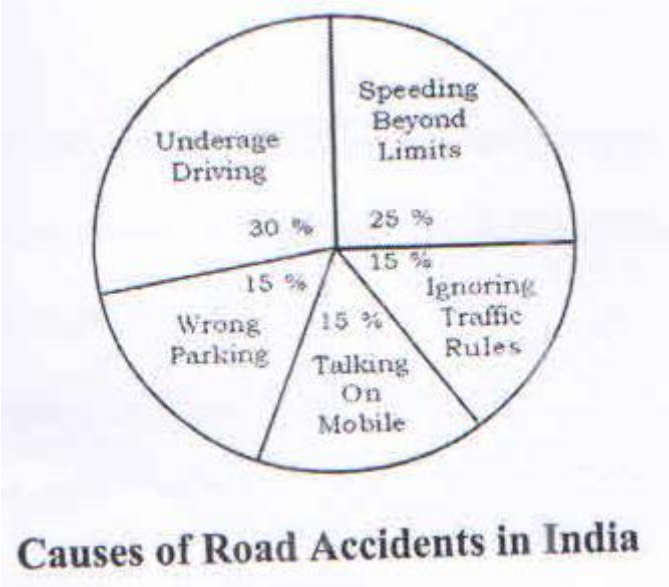
15 a) Observe the given pie chart and write a paragraph in about 150 words.



Causes of Road Accidents in India

b) Discuss the essentials of an effective oral presentation.

16 a) What are the guidelines to prepare a user friendly manual?

b) List the differences between technical and general writing.

17 a) Write a note on the E-mail etiquettes.

b) Assume that you are the General Manager of Comfort Home Appliances Ltd, Mumbai. Draft a memo and send it to all the Sectional Heads, asking them to identify the reasons of wastage of stationery and also warn the employees to restrain from such wastage.

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