Code No. 11391/CBCS

FACULTY OF ENGINEERING

BE III-Semester (CBCS)(Civil) (Main & Backlog) Examination, Nov/Dec 2018

Subject : Mechanical Technology (Part-B)

Time: 1½ Hours **Max. Marks: 37**

Note: Answer all questions from Part-A and any Three questions from part-B.

Part-A (13 Marks)

1. What are the various excavating equipment and hoisting equipment? 2
2. What are the factors that affect the output of drag line 3
3. Where is bucket conveyor used? 2
4. Write the construction of the following equipments
   (i) Differential and worm geared chain hoists (ii) guyed derricks 3
5. Give the application of (i) Revolving screen (ii) concrete vibrator 3

Part-B (24 Marks)

6. Briefly explain the interrelationship amongst material to be excavated, bucket type, bucket size and boom length 8

7. a) What are belt conveyor ? What are its applications? Show an arrangement of a belt conveyor system for transporting material from a ship to are handling plant 5
   b) What is the corking principle of whirled crane 3

8. a) Write the different types of aggregate and concrete producing equipment and differentiate between gyratory and hammer crusher with neat sketch 5
   b) Write the application of various compacting rollers 3

9. a) Describe the role of compressed air in heavy construction and explain how compressed air is obtained 6
   b) Distinguish between the tilting and non tilting type of concrete mixers. 2

10. a) Describe the operation and utility of the following equipment
    (i) Screen conveyor (ii) Tower crane 5
    b) Explain in detail why screens are used in grading of aggregates. 3

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Code No. 11390 / A/ CBCS

FACULTY OF ENGINEERING

B.E. (Civil) III-Semester (CBCS) (Main & Backlog) Examination,

November / December 2018

Subject : Electrical Technology (Part-A)

Time : 1 ½ hour **Max. Marks : 38**

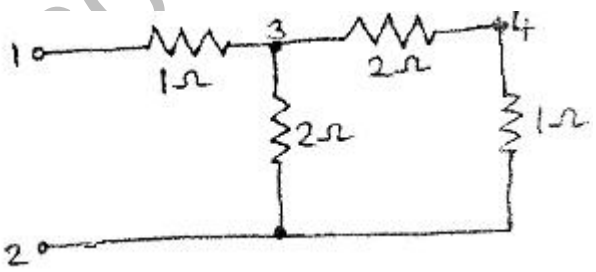
Note: Answer all questions from Part-A. Answer any Three questions from Part-B.

PART – A (14 Marks)

1	Define ohms law and Kirchhoff's laws.	3
2	Write the basic principle of a dc motor and generator.	2
3	What are different starting methods of three phase induction motor?	2
4	Write the applications of single phase induction motor.	3
5	Write the relationship between voltages and currents in star connection.	2
6	Define form factor and frequency.	2

PART – B (24 Marks)

7 a) Find the equivalent resistance between terminals 1 and 2 of the network shown. 4



b) What is impedance triangle explain with diagram. 4

8 a) Three 100 ohm non inductive resistors are connected in i) star ii) delta across a 400V, 50 Hz. Supply. Calculate power taken from the supply in each case. 4

b) What is transformer and explain the principle of transformer. 4

9 a) Explain torque-slip characteristics of three phase induction motor. 4

b) Explain how to conduct OC and SC tests on single phase transformer. 4

10 Explain how rotating magnetic field is produced in three phase induction motor. 8

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Code No. 11397

FACULTY OF ENGINEERING

B.E III – Semester (CBCS) (EE/Inst.) Examination, November / December, 2018

Subject : Electronic Engineering - II

Time : 3 Hours **Max Marks : 70**

Note: Answer all questions of Part – A & Any five questions from Part – B.

Part – A (20 Marks)

1 What is the effect of emitter bypass capacitor on LF response of RC coupled Amplifier?
2 Explain the need for cascading.
3 What are the advantages of negative feedback amplifiers.
4 Draw the equivalent circuit for Current Amplifier.
5 What is Barkhausen's criterion.
6 Distinguish between Amplifiers and Oscillator circuits.
7 What is Cross over distortion in Power Amplifiers.
8 Compare Class A, B & C Power Amplifiers based on efficiency.
9 What is a two level clipper.
10 How does a LPF act as Integrator?

Part – B (50 Marks)

11. (a) Draw the equivalent circuit of a Voltage shunt feedback amplifier and derive the expressions for R_{if} and R_{of}. (6)
(b)Classify various types of feedback amplifiers and draw their block diagram? (4)

12. Discuss in detail about various kinds of Couplings. Also mention their advantages, Disadvantages and applications? (10)

13. a) An Amplifier has an input impedance of 1 KΩ and O/P impedance of 10KΩ and a voltage gain of 10000. If a negative feedback is employed then find the result ant gain, input impedance, and output impedance. Given the feedback factor is 0.5. (4)
b) Discuss in detail various kinds of Distortions in Amplifiers. (6)

14. a) Give the Applications of each of the different types of Oscillators. (4)
b) Derive an expression for frequency of oscillation of Colpitt's oscillator. (6)

15. a) Explain the Operation of a Push- pull amplifier with a neat sketch. (5)
b) How do you eliminate it cross over distortion in class-B push pull power amplifier? Explain with neat sketches. (5)

16. a)Discuss the operation and derive the expressions for Square wave response of an RC High Pass Filter. (6)
b) Explain biased positive clamper with neat sketches. (4)

17. Write short notes on the following (10)
a) Class D operation
b) Frequency response of Direct coupled Amplifiers
c) Frequency stability of oscillators

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Code No. 11404/CBCS

FACULTY OF ENGINEERING

B.E III-Semester (CBCS) (ECE) (Main & Backlog) Examination, November / December 2018

Subject : Elements of Mechanical Engineering

Time: 3 Hour **Max. Marks : 70**

Note: Answer All questions From Part-A and any FIVE questions From Part-B.

PART-A (10x2 = 20 Marks)

1. Define path function
2. Define Zeroth law of thermodynamics. What is its importance
3. What are the causes of irreversibility?
4. What is the effect of clearance volume on work input and compression?
5. State Fourier's law of heat conduction and write the S.I. units of all terms
6. What is Newton's law of cooling?
7. Write about the concept of Black body
8. Compare belt drive and gear drive with respect to power transmission
9. Define addendum and dedendum
10. What are the different types of patterns used in casting?

PART-B (5 x 10 = 50 Marks)

11. A) Define enthalpy. Compare it with internal energy 4
    b) A heat engine operates on Carnot cycle between source and sink temperatures 227^oC and 27^oC respectively. If the heat engine receives 400KJ from the source. Find the network done, heat rejected to the sink and efficiency of the engine 6

12 a) Distinguish between four stroke and two stroke engine with power and fuel consumption 4
    b) During the testing of an engine the following readings were observed: Speed-1600rpm, net load on the brake drum = 1200N, brake drum radius = 0.65m. Find the torque and brake power developed by the engine 6

13 a) Derive an expression for heat loss through a composite wall of layers considering conductive heat transfer coefficient 4

    b) A brick wall (K-0.72 W/mK) is 0.6, thick. If the temperature of the inner and outer surfaces are maintained at 100^oC and 25^oC respectively Calculate the heat loss through the wall per square meter. Also find the temperature at the interior point of the wall at 16cm distance from outside surface. 6

14 a) Write about the classification of gears and their applications 5
    b) Sketch epi-cyclic gear train and explain it's working with diagram 5

15 a) What are different milling operations? Explain any two of them with diagram 5
    b) Sketch and explain the working of USM 5

16 a) What is critical radius of insulation? Explain with of derivation 5
    b) Explain about forging operation in metal forming 5

17 Write short notes on the following:
    a) Clausis inequality 3
    b) Working of single stage compressor 4
    c) Welding process 3

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Code No: 11409/CBCS

FACULTY OF ENGINEERING

B.E. III Semester (CBCS)(M/P/AE)(Main& Backlog) Examination, Nov./Dec. 2018

Subject: Mechanics of Materials

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A and any five questions from Part B

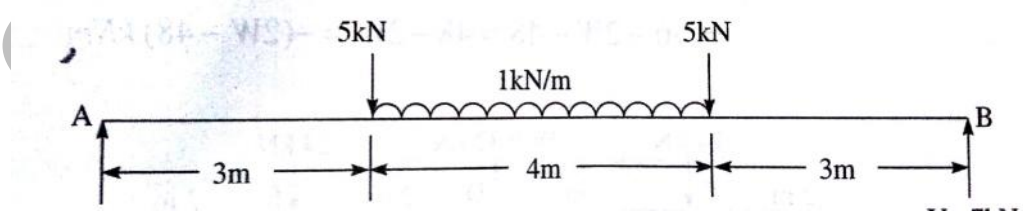
PART – A (10x2=20Marks)

1. What is ductility of a material? [2]
2. Write the Relationship between elastic constants (E, G & K)? [2]
3. What is the difference between overhanging beam and continuous beam? [2]
4. Define point of contraflexure? [2]
5. What is flitched beam? [2]
6. What is section modulus? Write the equation for circular section? [2]
7. Define slope and deflection. [2]
8. A tensile load of 60KN is gradually applied to a circular bar of 4cm diameter and 5m long. If young's modulus is 2 X 10^5 N/mm^2 . Determine strain energy absorbed by the rod. [2]
9. Define the following terms a)Torsion b) proof Resilience. [2]
10. A solid shaft of 150mm diameter is used to transmit torques transmitted by the shaft if the maximum shear stress induced to the shaft is 45 N/mm^2.Calculate maximum torque. [2]

PART – B (5 x10 = 50 Marks)

11. Three bars made of copper, zinc and aluminum are equal of length and have cross-section 500,750 and 1000 mm^2 respectively. They are rigidly connected at their ends. If this compound member is subjected to a longitudinal pull of 250KN, estimate the proportion of the load carried on each rod and the induced stresses. Take the value of E for copper = 1.3 X 10^5 N/mm^2, for zinc = 1.0 X 10^5 N/mm^2 and for aluminum = 0.8 X 10^5 N/mm^2. [10]

12. Draw Shear force and Bending Moment diagrams for the loaded beam as shown in below figure. [10]



13. A beam of I - section 500 mm deep and 190mm wide has flanges 25mm thick and web 15mm thick. It carries a shearing force of 400KN at a section assuming the moment of inertia to be 6.45 X 10^8 mm^4. Sketch the shear stress distribution across the section. [10]

Contd….2

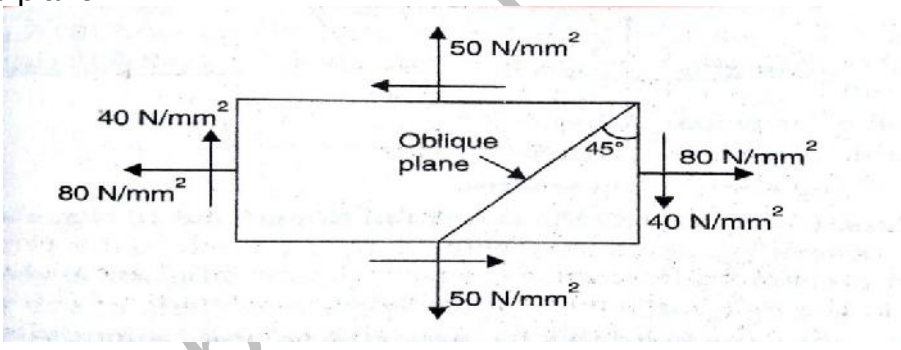
14. a)A beam 4m long, simply supported at its ends carries a point load W at its centre if the slope at the ends of the beam is not to exceed 1^0 find the deflection at the centre of the beam. [3]

b) A load of 100N falls to a height of 2cm collar rigidly attached to the lower end of the vertical rod 1.5m long and of 1.5 cm^2 cross-sectional area. The upper end of the vertical bar is fixed. Determine a) stress b)Elongation c) strain energy stored in the vertical rod. Take E = 2 X 10^5 N/mm^2. [7]

15. a) Find the power transmitted by a 75 mm diameter shaft at 140 rpm at a maximum shear stress of 60 N/mm^2 [3]

b) A leaf spring 750 mm long is required to carry a central point load of 8KN. If the central deflection is not to exceed 20 mm and the bending stress is not to exceed 200N/mm^2. Determine the thickness, width and number of plates. And also compute the radius to which the plates should be curved. Assume width of plates = 12 times the thickness and E = 2 X 10^5 N/mm^2. [7]

16. A point in a strained material is subjected to stresses as shown in below figure. Using Mohr's circle method, determine the normal, tangential and resultant stresses across the oblique plane. [10]



17. A hollow shaft, having an internal diameter 50% of its external diameter transmits 600KW at 150 r.p.m. Determine the external and internal diameter of the shaft if the shear stress is not to exceed 65N/mm^2 and the twist in a length of 3m should not exceed 1.4 degrees. Assume maximum torque is 1.2 times of the mean torque and modulus of rigidity = 1 X 10^5 N/mm^2. [10]

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Code No: 11417/CBCS

FACULTY OF ENGINEERING

BE III - Semester (CBCS)(CSE) (Main & Backlog) Examination, Nov. /Dec. 2018

Subject : Basic Electronics

Time: 3 Hours **Max Marks: 70**

Note: **Answer all questions from Part-A & Any five questions From Part-B.**

Part - A (20 Marks)

1. What is Hall coefficient? Where it is used? 2
2. Define ripple factor and explain its significance. 2
3. Why transistor is called as a current controlled device? 2
4. A JFET has drain current of 10mA. If I_{DSS} is 20mA and V_p = 4v. Find $V_{GS.}$ 2
5. The gain of an amplifier is 200. When negative feedback is applied, the gain decreases to 10. Determine the feedback ratio. 2
6. Why three R-C sections are used in R-C phase shift oscillator? 2
7. For a given OP-AMP, CMRR=10^5 and differential gain A_d=10^2. Determine Common – mode gain A_{CM}. 2
8. Realize AND gate using NOR gates only. 2
9. Explain LVDT briefly. 2
10. What is the function of delay circuit in CRO? 2

PART – B (50 Marks)

11. a) Draw the energy – band Picture for (i) an intrinsic (ii) an n-type and (iii) a p – type semiconductor. Indicate the positions of Fermi, the donor and the acceptor levels
    b) A FWR has input voltage of 240 V ac rms. Find the output dc current, rms current, PIV, if R_L = 10KΩ. (5)

12. a) What are the three regions of operation of a transistor? Explain 5
    b) Draw the circuit of CS amplifier and explain 5

13. List the five characteristics of an amplifier which are modified by negative feedback. Explain them. 10

14. a) Explain the working of differentiator circuit 5
    b) Give the truth table of full subtract or 5

15. Explain the construction of unbounded strain gauge and derive the expression for the gauge factor 10
16. a) Explain the working of Hartley oscillator with neat circuit diagram 5
    b) Draw the equivalent Circuit of UJT and explain 5

17. Write short notes on (i) zener Voltage regulator (ii) CRO 5+5

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Code No. 11425

FACULTY OF ENGINEERING

B.E. (I.T) III – Semester (CBCS) (Main & Backlog) Examination, Nov. / Dec. 2018

Subject: Probability & Random Processes

Time: 3 Hours **Max.Marks: 70**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (10x2 = 20 Marks)

1 State the generalized form of Bernoulli theorem. 2M

2 If A & B are independent events, Show that A^c & B^c are also independent events. 2M

3 Define Cumulative Distribution Function (CDF) of a random variable X. State its properties. 2M

4 A coin is tossed 1000 times. Find the probability of getting 520 heads. 2M

5 Show that Covariance of two independent random variables is 0. 2M

6 If X, Y are random variables and a, b are constants then prove that Var (aX - bY) = a^2Var(X) + b^2Var(Y) - 2ab.Cov(X, Y). 2M

7 State Ergodicity and Stationarity of a random process. 2M

8 Autocorrelation of a stationary process X(t) is given by $R_{xx}(\tau) = 25 + 4/(1+6\pi^2)$. Find its mean and variance. 2M

9 Define Gaussian process. 2M

10 Write any three properties of Power Spectral density of a stationary process. 2M

PART – B (5x10 = 50 Marks)

11 a) In a game of rolling a pair of dice, a player wins the game if he gets the sum 7 or 11 and losses the game if he gets the sum 2, 3 or 12. Any other sum is called a "carry over". If outcome of a throw is a carry over, the player throws the dice again until he wins or loses the game. The player also loses the game if he gets seven carry overs. What is the probability that the player wins the game? 6M

b) State and prove Bayes theorem. 4M

12 a) The Probability Density Function (pdf) of a continuous random variable X that can take values between X=2 and X=5 is given by f(x) = k.(1+x) Find

i) k
ii) Mean
iii) Variance
iv) P(X<4) 6M

b) Find Moment generating function of Binomial random variable, and hence find its mean. 4M

13 Let X & Y are two continuous random variables with joint density function f(x, y) = 4xy; 0 < x < 1 & 0 < y < 1 and f(x, y) = 0 ; elsewhere. Find

i) Var (X)
ii) Var (Y)
iii) Cov(X, Y)
iv) P(X< 1/2)
v) P (Y>1/4)
vi) P(X< 1/2,Y>1/4) 10M

14 a) Define stationary process. What are the necessary and sufficient conditions for a process to be stationary? 10M 3M

b) If U(t) = X.cost + Y.sint & V(t) = Y.cost + X.sint where X, Y are independent random variables such that E[X]=E[Y]=0, $E[X^2]=E[Y^2]=1$. Show that U(t) &V(t) are individually stationary in the wide sense (WSS), but they are not jointly stationary in the wide sense (WSS) 7M

15 Consider a white Gaussian noise of zero mean and power spectral density No/2 applied to a low-pass RL filter whose transfer function is given below. Find the auto-correlation function of the output random process.

$$H(f) = \frac{R}{R + i2\pi fL}$$ 10M

16 a) A speaks truth in 70% of cases and B speaks truth in 80% of cases. Find the probability that they contradict each other while speaking the same incident. 4M

b) A discrete random variable has the following probability distribution.

x	1	2	3	4	5	6
P(X= x)	k	3k	5k	7k	9k	11k

Find:
i) k
ii) Mean
iii) Variance
iv) P(1<X<5) 6M

17 a) If X, Y are two independent exponential random variables with common parameter 1. Find joint and marginal pdf's of U and V such that U=X+Y & V=X-Y 5M

b) For a random process having Autocorrelation $R_{xx}(\tau) = a.\ e^{-b|\tau|}$. Find Power spectral density. 5M

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