Code No. 11378 / CBCS / BL

FACULTY OF ENGINEERING

B.E. II – Semester (CBCS) (Backlog) Examination, May / June 2019

Subject: Engineering Physics – II

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

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

PART – A (10x2 = 20 Marks)

1 Define Space Lattice and Unit Cell.

2 Classify the conductors, semiconductors and insulators based on Band theory.

3 Explain the concept of magnetic domain.

4 Write applications of superconductors

5 Explain the concept of hole formation.

6 Give various of types of polarizations in dielectric medium.

7 Define fluorescence phenomenon.

8 Distinguish between bulk, thin films and nanomaterials.

9 Explain the concept of quantum confinement.

10 Give various methods in bottom – up process of nanomaterials.

PART – B (5x10 = 50 Marks)

11 Estimate the equilibrium concentration of Schottky defects.

12 Give the concept of Band formation. Explain the Kroning – Penney Model of Band formation quantitatively.

13 Explain the Weiss molecular field theory of ferromagnetism.

14 Explain the Hall effect. Deduce the expression for Hall Coefficient.

15 Explain various types of thermal evaporation methods for thin film formation.

16 Why nanomaterials are significant? Discuss the synthesis of nanomaterials by Sol-Gel process.

17 Define type-I and type-II superconductors. Explain the BCS theory of superconductors qualitatively.

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Code No: 11012/BL

FACULTY OF ENGINEERING

B.E. II/IV (Civil) I – Semester (Backlog) Examination, May / June 2019

Subject: Engineering Geology

Time: 3 Hours **Max. Marks: 75**

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

PART – A (10 x 2.5 = 20 Marks)

1) Define the terms cleavage and hardness of mineral.
2) Brief the development of amygdaloidal structure in rock basalt.
3) Define in a rock and draw a neat sketch of it with label the parts.
4) Write the types of the bore hole drilling methods.
5) Calculate coefficient of hardness of rock initial weight is 20 kg and loss of weight after the test is 18 grams.
6) What are the advantages of arch dam?
7) How do you prevent and solve the problem of sedimentation and siltation in the reservoirs?
8) Give any four techniques for tunnel support.
9) What are the reasons for origin of tsunami?
10) Give any four applications of GIS in engineering geology.

PART – B (5 x 10 = 50 Marks)

11. a) Explain the different methods of study of minerals. 5M
    b) Write geological classification and uses of following rocks. 5M
    (i) Dolerite and Basalt (ii) Sand stone and lime stone.
12. a) How do you recognize the faults in the field? 5M
    b) Describe the engineering classification of rock weathering. 5M
13. a) Write stress relationship of granite, gabbros, dolerites and basalt. 5M
    b) Explain the electrical resistivity survey in finding depth to bedrock in the site. 5M
14. a) What are the geological consideration in selection of dam site? 5M
    b) Write the leakage aspects of reservoir. 5M
15. a) Describe the engineering geological investigation for selection of tunnel. 5M
    b) Describe the causes of landslides. 5M
16. a) Write short note on the following:
    i) GIS application in the evaluation of geological terrain. 5M
    ii) Give a brief note on Tsunami occurred near Andaman and Nicobar island.
    b) Write the preventive measures for landslides. 5M
17. a) Describe the types of Indian soils and their engineering properties. 5M
    b) Test of weathering. 5M

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Code No: 11017/BL

FACULTY OF ENGINEERING

BE 2/4 (EE/Inst.) I-Semester (Backlog) Examination, May / June 2019

Subject : Electrical Measurements and instruments

Time: 3 Hours **Max. Marks : 75**

Note: Answer All Questions From Part-A & Any Five Questions From Part-B

PART-A (25 Marks)

1. The losses in a motor are calculated by measuring the input and output power of the motor and then taking their difference. For a particular motor the input is measured as 6250W $\pm$ 2% and the output is 5000W $\pm$ 3% Calculate the losses and their percentage limiting error. 3
2. Define a) Threshold and b) Dead zone 2
3. Explain how unidirectional torque is obtained in a transfer instrument 3
4. What do you mean by Phantom loading? 2
5. Give the reason, why low resistance is not measured by using Wheatstone bridge? 3
6. Explain why Maxwell's inductance-capacitance bridge is useful for the measurement of inductance of coils having Quality factor between 1 and 10. 2
7. A voltmeter of resistance 500Ω and a milliammeter of 1.0Ω resistance are used to measure a resistance by ammeter – voltmeter method. If the voltmeter reads 20 V and millimeter 100mA, calculate the value of measured resistance
   i) If the voltmeter is put across unknown resistance and the millimeter connected in series with the unknown resistance
   ii) If the voltmeter is put across the unknown resistance with ammeter connected on the supply side. 3
8. List out the tests to be carried out on Ferromagnetic materials to eliminate the inaccuracies 2
9. Explain the term standardization of a potentiometer. Describe the procedure of standardization of a d.c. potentiometer. 3
10. Define the following terms as used for instrument transformers
    a) Turns ratio b) Phase angle error 2

Part-B (50 Marks)

11 Describe the working of an Quadrant electrometer. Derive the expressions for deflection in the case of i) Heterostatic connection and ii) Idiostatic connection. If the instrument is spring controlled which of these instruments can be used for measurement of low voltages. 10

12 a) Design a multi range ammeter with ranges of 1A, 5A, 25A and 125A employing individual shunts in each case. A d' arsonval movement with an internal resistance of 730Ω and a full scale deflection of 5mA is available. 5

b) Describe the errors in Electrodynamometer type of wattmeters. 5

13 a) A single phase induction watt hour meter, tested at its full load rating of 240V, 10A is 1% slow at unity power factor and correct at 0.5 power factor lagging. Assuming that the friction error is compensated at all power factors, estimate the error at rated VA when the power factor of the system is 5
   i) 0.8 lagging ii) 0.8 leading

b) Explain the construction and working of Weston type frequency meter 5

…2

14 In a balanced bridge network, AB is a resistance of 500Ω in series with an inductance of 0.18H; BC and DA are non-inductive reactance of 1000Ω; and CD consists of a resistance R in series with capacitance C. A potential difference of 5 volt at a frequency of $5000/2\pi$ Hz is established between the points A and C. Draw to scale a phasor diagram showing the currents and potential difference in the bridge and from its determine the values of R&C. Check the result algebraically. 10

15 a) Describe the method for determination of B-H curve of a magnetic material using Step by Step method. 5

b) Explain the principle of Ballastic Galvanometer and also derive an expression for deflection of this meter. 5

16 a) Describe with the help of suitable diagrams, how A.C. potentiometer can be used for:
i) Measurement of reactance of a coil
ii) Calibration of Wattmeters and energy meters

b) An 8/1 current transformer has an accurate current ratio when the secondary is short circuited. The inductance of secondary is 60mH and its resistance, is 0.5Ω and the frequency is 50Hz. Estimate the current ratio and phase angle error when the instrument load resistance is 0.4Ω and inductance is 0.7mH. Assume no iron loss and magnetizing current equal to 1 percent of primary current. The permeability remains constant. 5

17 Explain any two from the following 5

a) Amplitude and phase measurement by using CRO. 5

b) Hall effect Transducers 5

c) Measurement of 3-ϕ power by using two wattmeter method. 5

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Code No. 11025/BI

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I – Semester (Backlog) Examination, May / June 2019

Subject: Electronic Devices

Time: 3 Hours **Max.Marks: 75**

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

PART – A (25 Marks)

1 Differentiate Zener breakdown and Avalanche breakdown
2 Define the terms a) Storage time b) Transition time c) Reverse Recovery time
3 Explain the purpose of Bleeder resistor.
4 A Half Wave Rectifier has a 25 V (rms) ac input and a 1 KΩ load resistance. Calculate peak voltage, load current and peak inverse voltage.
5 Draw the input and output characteristics of Common Collector configuration.
6 If the emitter current of transistor is 1 mA, assuming $\sim = 0.98$ find .
7 Write the significance of h-parameters.
8 Draw the approximate h-parameter model and write the condition to use approximate model.
9 Compare BJT and FET
10 An n-channel JFET has I_{DSS}= 10 mA, V_p= -4V, determine the drain current I_D at a Gate-Source voltage of -2V.

PART – B (50 Marks)

11 a) Explain the working of P-N junction under forward and reverse bias with neat diagrams and describe its V-I characteristics. (6M)
b) Derive the expression for Diffusion Capacitance of a P-N junction diode. (4M)

12 With neat circuit diagrams and necessary waveforms, explain the working of Centre-tapped Full Wave rectifier and derive the expressions for i) r.m.s and d.c components of voltages and currents ii) Ripple factor iii) efficiency iv) TUF. (10M)

13 a) Explain the bias stabilization mechanism of self bias circuit. Also derive the expression for stability factor. (7M)
b) Explain Thermal runaway and also write the condition to avoid thermal runaway. Also write the purpose of heat sink. (3M)

14 Analyse CE –BJT amplifier using exact h-parameter model to determine the expressions for A_i, R_i, A_V, R_o, A_p. (10M)

15 a) Describe the working principle of Depletion MOSFET along with its drain and transfer characteristics. (7M)
b) Prove that $g_m = \frac{-2}{Vp}\sqrt{I_D I_{DSS}}$ (3M)

16 a) Explain the working of Zener Voltage Regulator. (4M)
b) Describe the working of Inductor filter and derive its ripple factor. (6M)

17 Write short notes on
a) Compensation Techniques (4M)
b) Silicon Controlled Rectifier (3M)
c) FET Biasing (3M)

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Code No. 11029/BL

FACULTY OF ENGINEERING

B.E 2/4 (M/P) I-Semester (Backlog) Examination, May / June 2019

Subject: Machine Drawing

Time: 3 Hours **Max. Marks: 75**

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

PART-A (5 x 5 = 25 Marks)

1. Sketch (free hand) the half sectional front view of a flanged coupling to connect two shaft of diameter 25 mm.
2. Sketch with free hand front view and side view, a square headed bolt for having 20 mm shank diameter
3. Sketch a taper sunk key and double headed feather key.
4. Draw the profile of ACME and buttress thread.
5. Draw sectional front view and Side view from the left of the component shown in fig 1.

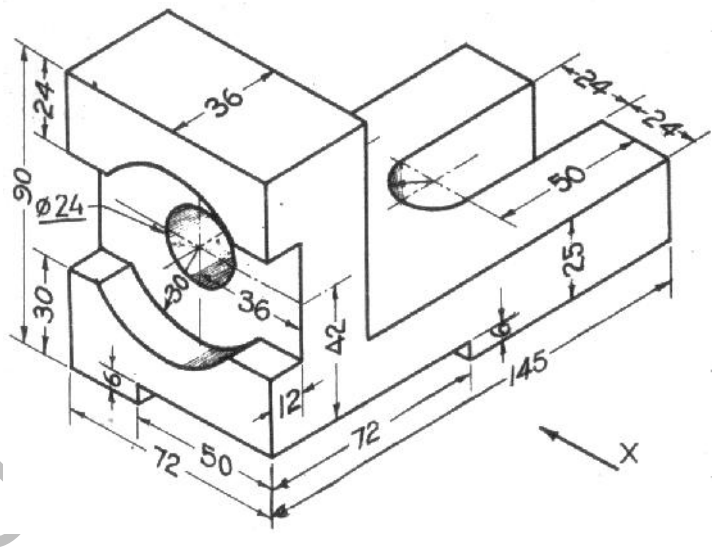
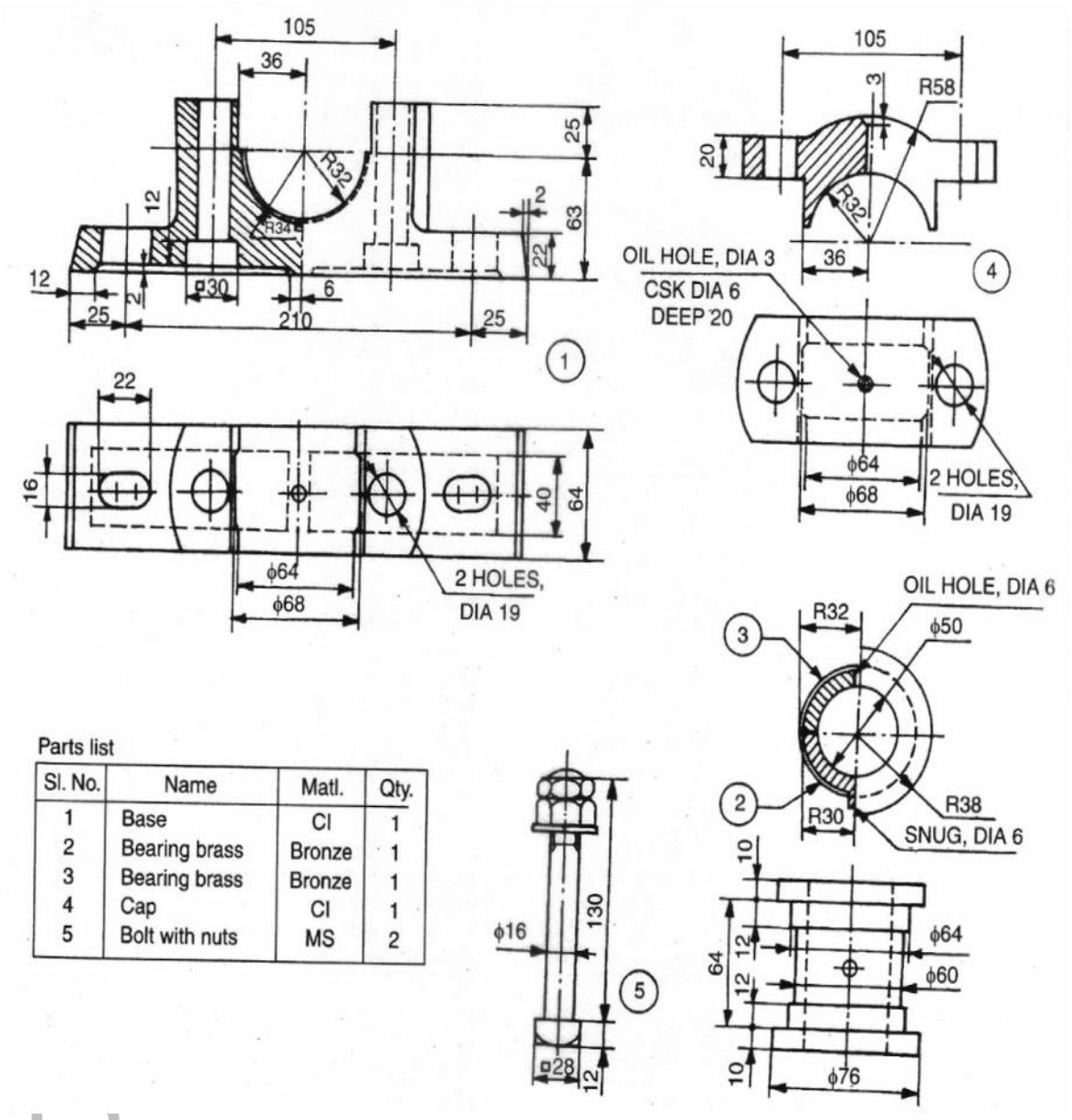


Fig. 1

Part B (50 Marks)

6. Draw the following views of a plummer block, suitable for supporting a shaft of diameter 50mm: Fig:2
   (a) half sectional view from the front, with left half in section,
   (b) sectional view from the side, and
   (c) view from above.

..2



Parts list

Sl. No.	Name	Matl.	Qty.
1	Base	CI	1
2	Bearing brass	Bronze	1
3	Bearing brass	Bronze	1
4	Cap	CI	1
5	Bolt with nuts	MS	2

Fig: 2

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Code No: 11032/BL

FACULTY OF ENGINEERING

B.E. 2/4 (AE) I – Semester (Backlog) Examination, May/June 2019

Subject: Automotive Engineering Drawing

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part A and Part B. Assume any missing data suitable and mention clearly

PART – A (25 Marks)

1. Draw conventional representation of the following:
   (a) Glass(material) (b) Bearing (Machine Component)
2. Draw the profile of the following threads:
   (a) ACME (b) Withworth
3. What is shaft coupling? Sketch split muff coupling.
4. Draw conventional representation of the following:
   (a) External thread (b) Internal thread
5. Draw the front view and top view for the following figure1.

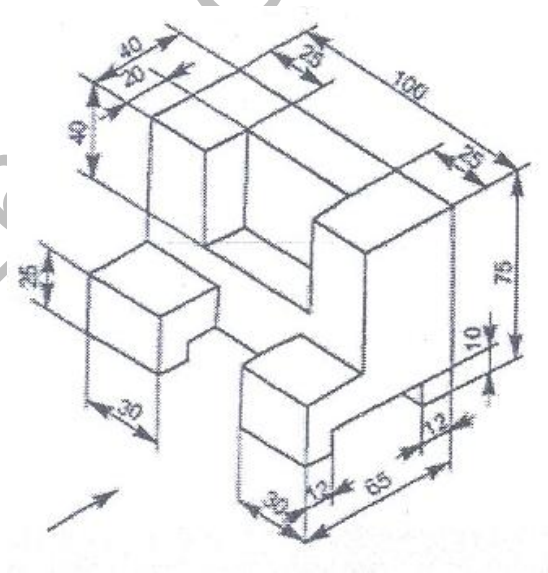
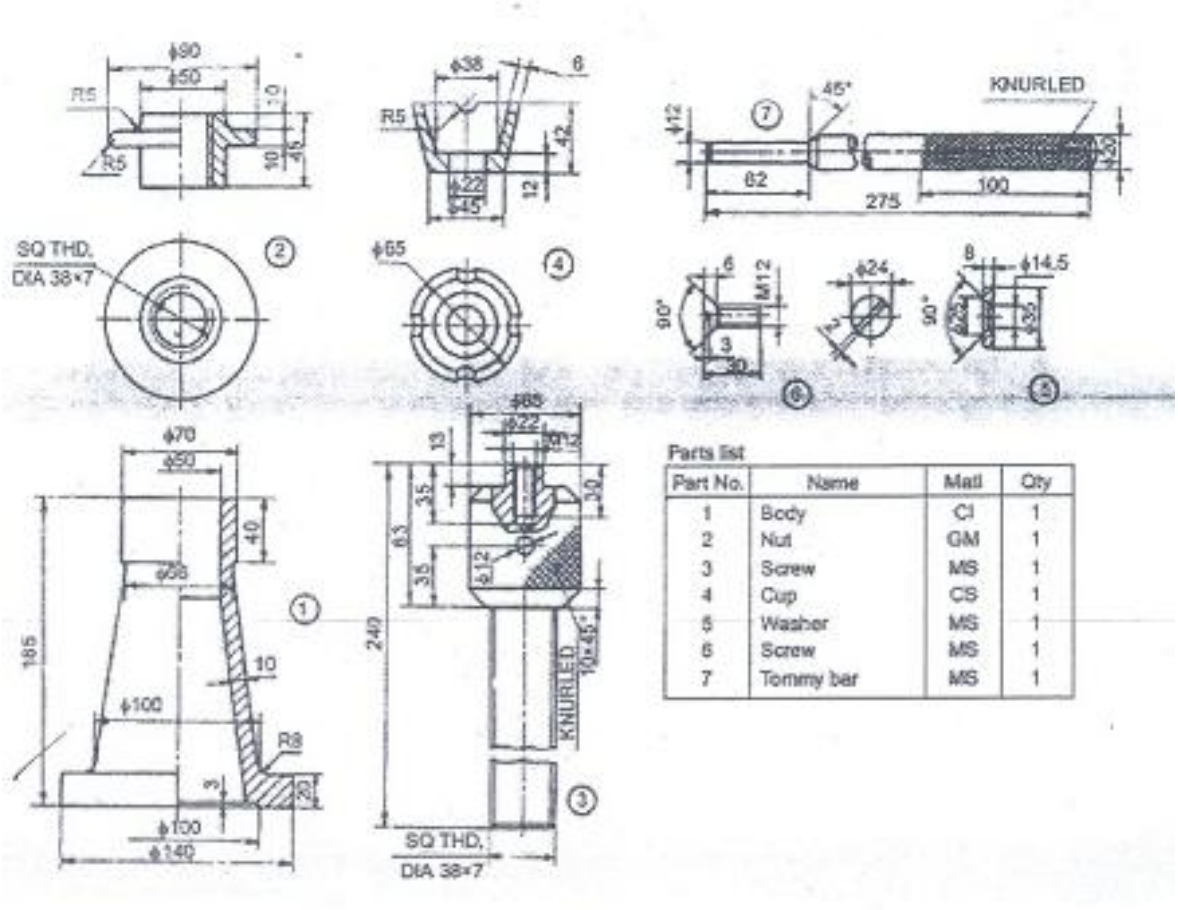


Figure 1

Contd..2

PART – B (50 Marks)

6. Assemble all the components shown in figure 2, to form screw jack assembly and draw
   a) Full sectional front view
   b) Top view
   c) Left side view



Part No.	Name	Matl	Qty
1	Body	CI	1
2	Nut	GM	1
3	Screw	MS	1
4	Cup	CS	1
5	Washer	MS	1
6	Screw	MS	1
7	Tommy bar	MS	1

Figure 2

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Code No. 11037/BL

FACULTY OF ENGINEERING

B.E. 2/4 CSE I – Semester (Backlog) Examination, May/ June 2019

Subject: Computer Architecture

Time: 3 Hours **Max. Marks: 75**

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

PART – A (25 Marks)

1. List the basic computer instructions formats. (3)
2. What are the advantages of common bus system. (2)
3. Differentiate between hardwired control unit and Micro programmed control unit. (2)
4. List the addressing modes related to memory. (3)
5. Define Vector processing. (2)
6. What is divide overflow? explain with example. (3)
7. Difference between isolated I/O and memory Mapped I/O. (3)
8. What is DMA? When it is Used? (2)
9. How many 128x8 RAM chips are needed to provide a memory capacity of 16KB? (3)
10. What is virtual memory? (2)

PART – B (50 Marks)

11. List out the typical memory reference instructions, register reference instructions and I/O oriented instruction and briefly explain them. (10)
12. Write a typical assembly language program to implement (P+Q)X(R-S)/(M+N) Using 3, 2, 1 address instructions. (10)
13. Explain Booths algorithm with the help of a flow chart and numerical example. (10)
14. (a) Explain in detail the Daisy chaining method. (5)
    (b) Explain the CPU-IOP communication. (5)
15. What is Cache memory? Explain the different mapping methods. (10)
16. (a) Explain about Array Processors. (5)
    (b) Explain interrupt cycle with examples. (5)
17. Write short notes on: (10)
    (a) Asynchronous data transfer.
    (b) Micro programmed control unit.

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Code No: 11043/BL

FACULTY OF ENGINEERING

B.E. 2/4 (IT) I – Semester (Backlog) Examination, May/June 2019

Subject : Electrical Circuits and Machines

Time: 3 Hours **Max. Marks: 75**

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

Part – A (25 Marks)

1. Derive the equation for the RMS value for sinusoidal source. 2
2. Prove that the average power in an AC circuit is VI cos 3
3. Why starting current in a dc moter is very high. 2
4. The current $i_1 = 10 \sin (wt + 30^o)$ A, $i_2 = 5 \sin (wt - 30^o)$ A, $i_3 = 15 \sin (wt + 30^o)$ A meet at a node. Find $i_4+i_1+i_2+i_3$ 2
5. Explain how a starting torque is produced in a single phase Induction motor. 3
6. Define the equivalent resistance and reactance of a transformer. 3
7. Draw the circuit diagram of long shunt and short shunt compound motors. 2
8. In a two watt meter method of 3-phase power measurement the readings are $W_1 = 100$ watts and $W_2 = 160$ watts. What is the total reactive power and p.f. 3
9. Define active power, reactive power and draw the power triangle. 3
10. Explain the principle of operation of 3 phase Induction motor. 2

Part – B (50 Marks)

11. (a) With a neat sketch explain the concepts of self inductance and mutual inductance. 4

    (b) Two coils with terminals T_1, T_2 and T_3, T_4 respectively are placed side by side, measured separately, the inductance of the first 1200 and that of the second coil is 800 with T_2 joined T_3, the total inductance between the two coils is 2500 . What is the mutual inductance? 6

12. (a) What are the starting methods of slip ring Induction motors. 4

    (b) With a neat diagram explain the rotor resistance starting method of slip ring induction motor. 6

13. (a) Draw and explain the significance of equivalent circuit of a transformer. 5

    (b) Describe the procedure for conducting open circuit test on a Transformer. What are the parameters calculated from the test? 5

14. (a) What will happen if the field of a DC motors is opened. 4

    (b) With a neat diagram explain the principle of operation and construction of a DC motor. 6

15. (a) With a neat diagram the working of stepper motor. 5

    (b) Derive the relation between the line and phase currents in a delta connected system. 5

contd..2

16. (a) The Frequency of the e.m.f. in the stator of 4 pole induction motor is 50 Hz and that in rotor is 2 Hz. What is the slip and at what speed is the motor running. 5
    (b) Explain Torque & slip characteristics of a 3.5 Induction motor. 5

17. Write short notes on
    (a) Armature reaction 3
    (b) Dot convention 3
    (c) Explain the working principle of an auto transformer with a neat sketch. 4

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