

Roll No.

Total Pages : 3

235304

December, 2019

**B.Sc. (Hons.) Physics III SEMESTER
Electrical Circuits & Network Skills (SECP-02)**

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART - A

1. (a) State Ohm's law and its limitations. (1.5)
- (b) What is meant by Capacitive Reactance? (1.5)
- (c) What is transformation ratio in the transformer? (1.5)
- (d) What are the requirements of a circuit? (1.5)
- (e) How does a dc motor differ from a dc generator? (1.5)
- (f) Does inductor work on AC or DC ? (1.5)
- (g) Define resistors and its applications. (1.5)
- (h) How relay is protection device? (1.5)

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- (i) A 4-pole, 220 V DC shunt motor has armature and shunt field resistances of 0.2 ohms and 220 ohms respectively. It takes 20 A at 220 V from the source while running at a speed of 1000 rpm. Find (i) Field current (ii) Armature current. (1.5)
- (j) R_a is resistance at A, R_b is resistance at B, R_c is resistance at C in star connection. After transforming to delta, What is the resistance between B and C? (1.5)

PART - B

2. (a) Define Series Circuit. Four Coils having resistances of 3, 5, 10 and 12 Ohms are connected in series across 120 V. Determine (i) equivalent resistance of the circuit (ii) current flowing through the circuit and (iii) voltage drop across individual coils. (10)
- (b) How can a multimeter be used to test a diode? (5)
3. (a) Explain with the help of relevant circuit diagrams, how an analog multimeter can be used as a DC voltmeter, DC ammeter and ohm meter. (10)
- (b) Define the speed of AC motors and what does it depend on? (5)

4. Describe the construction and working of dc generator. Support your answer with relevant diagrams. List the different kind of losses that occur in the DC generator. (15)
5. Discuss the basic design and working of single phase motor. Explain its applications. (15)
6. (a) Write the procedure to fabricate extension board and also draw diagram? (8)
- (b) How does ground fault protection work? Justify with an example. (7)
7. Write short notes on :
- (i) Power components of AC source.
- (ii) Fuses and disconnect switches.
- (iii) AC and DC Electricity. (5×3=15)