Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–III(New) EXAMINATION – SUMMER 2016**

**Subject Code:2130105** **Date:04/06/2016**

**Subject Name:Electrical Machines & Electronics**

**Time:10:30 AM to 01:00 PM** **Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

**MARKS**

**Q.1** **Short Questions** **14**

**1** In 8085 microprocessor, the RST6 instruction transfer programme execution to following location

a) 0030H
b) 0024H
c) 0048H
d) 0060H

**2** 8085 microprocessor has how many pins

a) 30
b) 39
c) 40
d) 41

**3** The opamp can amplify

a) AC signals only.
b) DC signals only.
c) both AC and DC signals
d) neither AC not DC signals

**4** The input signal for an instrumentation amplifier usually comes from

a) an inverting amplifier.
b) a resistor.
c) a differential amplifier.
d) a Wheatstone bridge

**5** Power factor can be defined as

a) both option B and C
b) cosine of angle between voltage and current.
c) ratio of resistance versus impedance.
d) sine of voltage and current.

**6** The oil used in the transformers serves as a

a) insulator
b) coolant
c) both A and B
d) none of the above

**7** The shaft torque of a dc motor is less than the electromagnetic torque because of

a) mechanical losses
b) hysteresis losses
c) ohmic losses
d) eddy current losses

**8** In a single phase induction motor driving a fan load, the reason for having a high resistance rotor is to achieve

a) low starting torque
b) quick acceleration
c) high efficiency
d) reduced size

**9** A 4 point starter is used to start and control the speed of a

a) DC shunt motor with armature resistance control
b) DC shunt motor with field weakening control
c) DC series motor
d) DC compound motor

**10** In a transistor amplifier the _____ junction is reverse biased.

a) collector base junction
b) emitter base junction
c) CE base junction.
d) none of these.

**11** By looking at which part of the motor, it can be easily confirmed that a particular motor is D.C. motor?

a) Frame
b) Shaft
c) Commutator
d) Stator

**12** In a D.C. shunt motor, speed is

a) independent of armature current
b) directly proportional to the armature current
c) proportional to the square of the current
d) inversely proportional to the armature current

**13** For starting a D.C. motor a starter is required because

a) it limits the speed of the motor
b) it limits the starting current to a safe value
c) it starts the motor
d) none of the above

**14** In D.C. generators, the cause of rapid brush wear may be

a) severe sparking
b) rough commutator surface
c) imperfect contact
d) any of the above

**Q.2** **(a)** Explain merits and demerits of overhead system and underground system for electric supply. **03**

**(b)** Explain Open circuit characteristic of D.C. generator. **04**

**(c)** With the help of a neat diagram, explain the operation of a D. C. Generator. **07**

**OR**

**(c)** Explain External and Internal characteristics of D.C. shunt generator. **07**

| | | | |
|---|---|---|---|
| **Q.3** | **(a)** | Explain CT and PT in brief? | **03** |
| | **(b)** | Describe working principle of shaded pole type single-phase induction motor with neat diagram. | **04** |
| | **(c)** | Explain different speed control methods for D.C. series motor. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain following terms of a 3-phase induction motor :<br>(i) Cu loss (ii) Iron loss (iii) efficiency | **03** |
| | **(b)** | Write different starters used for 3-phase induction motor and explain any one of them. | **04** |
| | **(c)** | Explain different speed control methods for D.C. shunt motor. | **07** |
| **Q.4** | **(a)** | What is Power Factor? Discuss the effect of low power factor. | **03** |
| | **(b)** | What is a tariff? Explain the types of tariff. | **04** |
| | **(c)** | Compare between Indoor and Outdoor substations. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | What is an Op-Amp? State various applications of Op-Amp in brief. | **03** |
| | **(b)** | Draw a circuit diagram and explain a two-stage transistor amplifier in brief. | **04** |
| | **(c)** | State and prove De-Morgan's theorems. | **07** |
| **Q.5** | **(a)** | Draw and explain half wave rectifier. | **03** |
| | **(b)** | Explain three-phase bridge rectifier. | **04** |
| | **(c)** | Draw and explain pin diagram of 8085 microprocessor. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain multi stage amplifier in brief. | **03** |
| | **(b)** | Explain the following :<br>(i) OR (ii) NOR (iii) AND (iv) NAND | **04** |
| | **(c)** | Draw and briefly mention internal architecture of 8085 microprocessor. | **07** |

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