

Enrollment No.....



Faculty of Engineering
End Sem (Even) Examination May-2018
FT3CO11 Electrical Technology & Safety in Electrical
System

Programme: B.Tech.

Branch/Specialisation: FT

Duration: 3 Hrs.**Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Q.1 i. Transformer action requires a: 1
 (a) Constant magnetic field (b) Increasing magnetic flux
 (c) Alternating magnetic flux (d) Alternating electric flux
- ii. The mmf produced by the rotor current of a 3-phase induction motor: 1
 (a) Rotates at the speed of rotor in the air gap.
 (b) Is at stand still with respect to stator mmf.
 (c) Rotates at slip speed with respect to stator mmf.
 (d) Rotates at synchronous speed with respect to rotor.
- iii. In a HRC fuse, the time between cut off and final current zero is known as: 1
 (a) Total operating time (b) Arcing time
 (c) Pre-arcing time (d) Any of these
- iv. The transient voltage that appears across the contacts at the instant of arc extinction is called: 1
 (a) Recovery voltage (b) Restriking voltage
 (c) Supply voltage (d) Peak voltage
- v. Dry human skin has a resistance of 1
 (a) 1,00,000 Ω (b) 300 Ω
 (c) 20 Ω (d) 100 Ω
- vi. Current flow from hand to hand is called 1
 (a) Step potential (b) Touch potential
 (c) Amperage (d) None of these

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- vii. For house hold wiring and small units, the following should be used for safety measure: **1**
(a) MCB (b) ACB (c) OCB (d) MCCB
- viii. Check list for job safety analysis consists of: **1**
(a) Work area, material, machine and tools
(b) Men, machine, material and tools
(c) Men, machine, work area and tools
(d) Men, work area, material and tools
- ix. Which of the following data is not required for hazard identification? **1**
(a) Land use (b) Contaminant levels
(c) Affected population (d) Estimation of Risk
- x. The Indian electricity rules of 1956 cover **1**
(a) Inspections of electric installation
(b) Licensing
(c) General safety precaution
(d) All of these
- Q.2 i. What are the fundamental requirements of protective relaying? **2**
ii. Distinguish between over current relay, directional relay and differential relay. **3**
iii. Give the constructional details of a synchronous machine. **5**
OR iv. Give the construction details of a 3-phase induction motor. **5**
- Q.3 i. Define the term recovery voltage and rate of rise of restriking voltage. **3**
ii. Explain the advantages of modern type of fuse and describe in details with the help of a neat sketch the constructional detail and operation of any one modern type of a fuse. **7**
OR iii. Why do you need a ground wire? Explain neutral and solid grounding. **7**
- Q.4 Attempt any two:
i. Discuss the effect of current and voltage on human being. **5**

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- ii. Explain magnetic field effect of human being and illustrate the safety precautions to be taken during magnetic field. **5**
iii. Briefly explain the various classes of insulation. **5**
- Q.5 i. List the objectives related to safe commissioning of electrical substation. **4**
ii. Discuss the sequence of steps involved in the systematic installation of a typical electrical substation. **6**
OR iii. Write short note on: Protection and interlock system on safety. **6**
- Q.6 i. How could electrical hazards be minimized? **4**
ii. Explain the steps to be taken on the occurrence of electricity fire. **6**
OR iii. What are the statutory requirements which are required to check before certifying the fire fighting readiness of the plant? **6**

Marking Scheme

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Q.1	i.	Transformer action requires a: (c) Alternating magnetic flux	1				
	ii.	The mmf produced by the rotor current of a 3-phase induction motor: (b) Is at stand still with respect to stator mmf.	1				
	iii.	In a HRC fuse, the time between cut off and final current zero is known as: (b) Arcing time	1				
	iv.	The transient voltage that appears across the contacts at the instant of arc extinction is called: (a) Recovery voltage	1				
	v.	Ory human skin has a resistance of (a) 1,00,000 Ω	1				
	vi.	Current flow from hand to hand is called (b) Touch potential	1				
	vii.	For house hold wiring and small units, the following should be used for safety measure: (a) MCB	1				
	viii.	Check list for job safety analysis consists of: (a) Work area, material, machine and tools	1				
	ix.	Which of the following data is not required for hazard identification? (d) Estimation of Risk	1				
	x.	The Indian electricity rules of 1956 cover (d) All of these	1				
Q.2	i.	Fundamental requirements of protective relaying 1 mark each	2				
	ii.	Over current relay Directional relay Differential relay	3	(1 mark *2) 1 mark 1 mark 1 mark			
	iii.	Construational details of a synchronous machine.	5				
OR	iv.	Construction details of a 3-phase induction motor.	5				
Q.3	i.	Recovery voltage Rate of rise of restriking voltage	3	1.5 marks 1.5 marks			
	ii.	Advantages of modern type of fuse Diagram Operation of any one modern type of a fuse	7	3 marks 2 marks 2 marks			
OR	iii.	Ground wire Neutral grounding Solid grounding	7	2 marks 2.5 marks 2.5 marks			
Q.4		Attempt any two:					
	i.	Effect of current and voltage on human being 1 mark for each point	5	(1 mark *5)			
	ii.	Magnetic field effect of human being Safety precautions in magnetic field.	5	2 marks 3 marks			
	iii.	Various classes of insulation 1 mark each	5	(1 mark *5)			
Q.5	i.	Objectives to safe commissioning of electrical substation. 1 mark each	4	(1 mark *4)			
	ii.	Sequence of steps involved in the systematic installation 2 marks each	6	(2 marks *3)			
OR	iii.	Protection Interlock system on safety	6	3 marks 3 marks			
Q.6	i.	Electrical hazards be minimized 1 mark each	4	(1 mark *4)			
	ii.	Steps to be taken on the occurrence of electricity fire 1 mark each	6	(1 mark *6)			
OR	iii.	Statutory requirements 1 mark each	6	(1 mark *6)			
