TESTING AND MAINTENANCE OF ELECTRICAL MACHINES

(Code : EET-604)

[Elective-i]

Full Marks : 70 *Time* : 3 hours

Answer any **five** questions

Figures in the right-hand margin indicate marks

1. (*a*) Why starters are used in dc machines ? 2
   (*b*) Give the name of tests that should be performer before commissioning electrical equipment. 5
   (*c*) What are the factors are to be considered for outdoor are to be considered for outdoor installation of transformer. 7
2. (*a*) Write down the function of relay. 2
   (*b*) Write down the causes of noise in transformer. 5
   (*c*) Explain the construction and working of buchholz relay. 7
3. (*a*) What is the purpose of drying out of transformer ? 2
   (*b*) Write the process of drying of transformer. 5
   (*c*) Write down the steps for commissioning of power transformer. 7
4. (*a*) What is the function of breather in transformer ? 2
   (*b*) Before commissioning of substation, what points should be checked. 5
   (*c*) What are the factors affecting the earth resistance ? 7
5. (*a*) Why earthing is required ? 2
   (*b*) What points should be considered at the time of installation of earthing ? 5
   (*c*) What are the checking or testing of circuit breaker should be done before installation ? 7
6. (*a*) What is the necessity of circuit breaker ? 2
   (*b*) Write down the advantages of preventive maintenance. 5
   (*c*) What are the causes of equipment breakdown ? 7
7. (*a*) What are the advantages of scheduled maintenance ? 2
   (*b*) Write down the advantages and disadvantages of SF_6 circuit breaker. 5
   (*c*) Write down the short notes on routine test of transformer. 7

UTILIZATION OF ELECTRICAL ENGINEERING AND TRACTION

(Code : EET-602)

Full Marks : 70 *Time* : 3 hours

Answer any **five** questions

Figures in the right-hand margin indicate marks

1. (*a*) What is skin effect ? 2
   (*b*) Explain briefly the factors affecting the amount of Electro-deposition. 5
   (*c*) State the advantage of electrical heating. 7
2. (*a*) What is current efficiency ? 2
   (*b*) Explain Faraday's laws of Electrolysis. 5
   (*c*) Explain working principle of Direct Arc Furnace. 7
3. (*a*) Define M.H.C.P. 2
   (*b*) Explain about Laws of Illumination. 5
   (*c*) Explain Group and individual drive. 7
4. (*a*) What is Luminous intensity ? 2
   (*b*) Give principle of microwave heating with application. 5
   (*c*) What is Resistance welding ? Explain different types of resistance welding. 7
5. (*a*) What is polar curves ? 2
   (*b*) Explain about Regenerative Braking. 5
   (*c*) Explain about starting and running characteristics of D.C motor. 7
6. (*a*) Define utilisation factor. 2
   (*b*) Explain principle of Arc Welding. 5
   (*c*) Explain working of direct core type Induction furnace. 7
7. Write short notes on any *two* : 7 × 2
   (*i*) High pressure mercury vapour Lamp
   (*ii*) Series-parallel method of speed control of motor
   (*iii*) Electroplating.

SWITCH GEAR AND PROTECTIVE DEVICES

(Code : EET-601)

Full Marks : 70 *Time* : 3 hours

Answer any five questions

Figures in the right-hand margin indicate marks

1. (*a*) What do you understand by percentage reactance ? 2

   (*b*) Why do we use reactors in the power system ? Explain the various methods of connecting short circuit current limiting reactors in the power system ? 5

   (*c*) With neat sketch explain about HRC type of fuse ? 7

2. (*a*) Define and explain fusing current and breaking capacity ? 2

   (*b*) Explain low resistance method of Arc extinction ? 5

   (*c*) The plant capacity of a 3-phase generating station consists of two 10,000 kVA generators of reactance 12% each and one 5000kVA generator of reactance 18%. The generators are connected to the station busbars from which load is taken through three 5000 kVA stepup transformers each having a reactance of 5%. Determine the maximum fault MVA which the circuit breakers on
   (*i*) Low voltage side and
   (*ii*) High voltage side may have to deal with. 7

3. (*a*) Define Arc voltage, restriking voltage and recovery voltage ? 2

   (*b*) Explain difference between fuse and circuit breaker. 5

   (*c*) Discuss the constructional details and operation of a typical low oil circuit breaker ? 7

4. (*a*) What is the rating of circuit breaker ? 2

   (*b*) Describe various steps for calculating the actual relay operating time ? 5

   (*c*) With neat sketch explain constructional and operating details of vaccum circuit breaker 7

5. (*a*) What is pickup current ? 2

   (*b*) Describe the construction and principle of an induction type directional over current relay. 5

   (*c*) Describe the construction and working of Buchholz relay. 7

6. (*a*) What is P.S.M ? 2

(*b*) Write advantages of Air blast circuit breaker ? 5

(*c*) What is lighting ? Describe the mechanism of lighting discharge ? 7

7. (*a*) What is static relay, explain its advantages ? 2

(*b*) Explain with neat diagram of merz-price circulating current principle for the protection of alternator ? 5

(*c*) Discuss the construction and working principle of a valve type arrester ? 7

E & IE

(Code : EET-603)

Full Marks : 70 *Time* : 3 hours

Answer **all** questions

Figures in the right-hand margin indicate marks

1. Answer the following in *one* or *two* sentences : 2 × 5

   (*a*) What is the full form of C.T.S ?

   (*b*) Where we use Egg Insulator and why ?

   (*c*) Where we use T.P.I.C. & T.P.I.C.N. main switch ?

   (*d*) What is the permissible voltage drop in internal domestic wiring ?

   (*e*) Where we found T.P.M.O. switch and why it is used ?

2. Answer any *two* : 10 × 2

   (*a*) What are the different types of wiring ? Explain about conduit system of wiring.

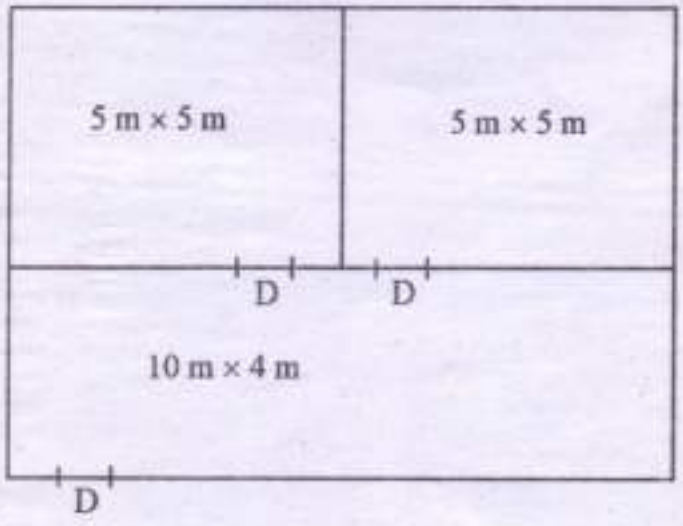
   (*b*) Estimate the material required for stay-set arrangement with neat sketch.

   (*c*) Estimate the material required for GI pipe— Earthing with neat sketch.

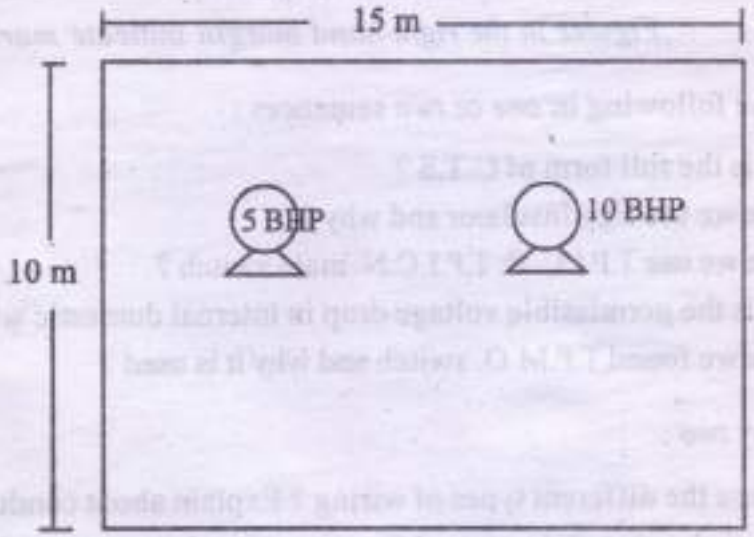
3. Answer any *two* : 20 × 2

   (*a*) Estimate the quantity of materials required for erection of a 150 KVA, 11/04 KV plinth mounted distribution substation with neat sketch.

   (*b*) Draw the installation plan of the above layout for providing conduit system of wiring and estimate the material required for the above installation. The installation contains only light points as per suitable nos. at suitable place and height of the cealing is 3·5 m. Assume all other data.



(c) The above two motor are installed and provide conduit system of wiring after main switch. Each motor is operated by individual main switch and starter. Draw the installation plan and estimate the material required for above installation. Assume all other data ?



(d) Prepare a list of materials required for giving service connection to a single storeyed building at 230 V, 50 Hz, single phase having a load of 5 KW. The supply is to be given from overhead lines 15 m away from the building. Also draw the neat sketch of it.

VI- SEM- ELECTRICAL/2019(W)

EET601- SWITCH GEAR AND PROTECTIVE DEVICES

Full Marks: 80 Time : 3 Hours

Answer any **FIVE** Questions including Q No. 1& 2

Figures in the right hand margin indicates marks

1	Answer **ALL** the Questions	2x10
(i)	Define PSM.	
(ii)	What is fuse?	
(iii)	Define pick up current.	
(iv)	Define restriking voltage.	
(v)	What is the function of the surge arrestor?	
(vi)	Which material is best suitable for making fuse?	
(vii)	What is short circuit KVA?	
(viii)	What is IDMT relay?	
(ix)	What are the faults in power system?	
(x)	Define arc voltage.	
2.	Answer any **SIX** Questions	5x6
(i)	Explain the working of OCB.	
(ii)	Describe the characteristics of the fusing materials.	
(iii)	Explain the electromagnetic attraction type relay.	
(iv)	What are the properties of circuit breaker? How it is different from the fuse?	
(v)	Explain the horn gap lightning arrestor with a neat diagram.	
(vi)	What is symmetrical fault in power system? How short circuit KVA is calculated?	
(vii)	Explain the vacuum circuit breaker.	
(viii)	Discuss how arc is created and principles behind arc extinction.	
3.	Explain different types of lightning arrestor with their advantages and limitations.	10
4.		
(i)	Name the switch gear equipments. What are the basic features of switch gear equipments.	7
(ii)	What are the ratings of circuit breaker?	3
5.		
(i)	What is fusing factor?	2
(ii)	Explain HRC fuse with a neat diagram. What are its limitations?	8
6.	Explain the various protection system of alternator.	10
7.	Write short notes on any **four**.	
(i)	Buccholz relay.	2.5x4
(ii)	Merz-price voltage balance system.	
(iii)	IDMT relay.	
(iv)	Harmful effects of lightning.	
(v)	Maintenance of transformer.	

VI- SEM/ELECTRICAL/ELECTRICAL(I&C)/2019(W)/(New)

EET-602 -UTILISATION OF ELECTRICAL ENERGY & TRACTION

Full Marks: 80 Time: 3 Hours

Answer any FIVE Questions including Q No. 1 & 2

Figures in the right hand margin indicates marks

1	Answer ALL the questions:	2x10
(i)	State group drive and individual drive.	
(ii)	Define current efficiency.	
(iii)	Why alternating current is most suitable for resistance welding?	
(iv)	State Lambort's cosine law of illumination.	
(v)	What do you understand by illumination and mention the properties of good illumination?	
(vi)	What do you mean by stroboscopic effect?	
(vii)	What is the function of choke and condenser used in the fluorescence lamp?	
(viii)	State and explain Joule's law.	
(ix)	What is coefficient of adhesions in traction system?	
(x)	Write down the applications of dielectric heating.	
2	Answer any SIX questions:	5x6
(i)	Explain the construction and working of direct arc furnace.	
(ii)	State and explain the Faraday's law of electrolysis.	
(iii)	What are the advantages of electric heating?	
(iv)	What are the factors governing electrodeposition?	
(v)	Explain about the metal arc welding.	
(vi)	Two similar lamps having uniform intensity of 500cpin all direction below the horizontal plane and are mounted at a height of 4m. What must be the maximum spacing between the lamps so that the illumination on the ground midway between the lamps shall be at least one half of the illumination directly under the lamp?	
(vii)	Explain about electroplating.	
3	Explain the working and application of mercury vapour lamp.	10
4	A lamp having a uniform cp of 200 in all direction is provided with a reflector which directs 60% of the total light uniformly on a circular area of 10m diameter. The lamp is hung 6m above the area. Calculate the illumination: (i)At the centre. (ii)At the edge of the surface with and without the reflector & also determine the average illumination without reflector.	10
5	Explain different types of resistance welding.	10
6	Describe different types of braking used in electric motor.	10
7	Explain the typical speed-time curve for main line service traction system.	10

6TH- SEM/ELECTRICAL/E&M/2019(W)/ (New)

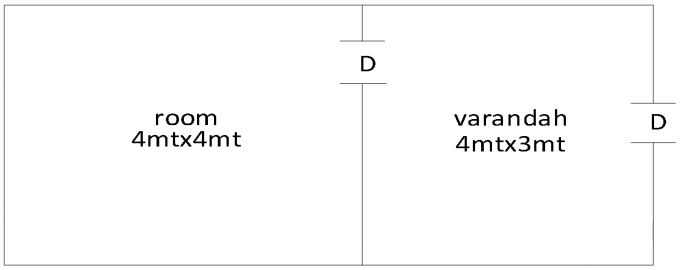
EET-603/EMT-603-ELECTRICAL INSTALATION AND ESTIMATING

Full Marks: 80 Time : 3 Hours

Answer any **FOUR** Questions including Q No. 1& 2

Figures in the right hand margin indicates marks

1.	Answer the following questions in one or two sentence :	[2× 10]
(a)	What are the full form of XLPE, TPIC?	
(b)	What is the permissible voltage drop in an internal domestic house wiring?	
(c)	What is the minimum ground clearance required for 11kv and 132kv transmission line?	
(d)	What is the maximum load that is permitted in a power circuit and lighting circuit?	
(e)	Write down the full form of TPMO and it's function?	
(f)	State what is Egg insulator and where it is used ?	
(g)	State the size of batten required to carry 12 nos. of single core PVC wire ?	
(h)	What do you mean by guarding of overhead line?	
(i)	What is ACSR & its use ?	
(j)	What are the different types of internal house wiring ?	
2.	Answer any **FOUR** questions:	
(a)	Write down short notes on pole mounted substation and plinth mounted substation.	[5× 4]
(b)	Where and why following materials are used: (1) AB switch (2) Barbed wire (3) Egg type insulator (4) Isolators	
(c)	Differentiate between fuse and MCB	
(d)	Why earthing is required in a domestic house wiring? Mention a list of materials required for a pipe earthing.	
(e)	Draw wiring diagram of an internal house wiring starting from energy meter and explain briefly the items used in the wiring.	
3.`	A small workshop having a floor of 8mt × 4mt consist of following machinery (a) One shaper machine with 5 HP ,415 V,3 Phase motor (b) One lathe driven by 3 HP.415 V ,3 phase motor (c) One drilling machine with 2HP ,415V, 3 phase motor Prepare a list of materials required and estimate the complete cost of wiring scheme.	[20]

4.	Estimate the materials required to provide internal wiring for a residential building whose plan is given below.  Use concealed PVC conduit. Draw the electrical wiring diagram. Prepare the list of materials with specification.	[20]
5.	Estimate the quantity of materials required for installation of a 100 KVA ,11/0.4 KV ,50 Hz pole mounted distribution substation available about 50 mt. from the proposed site. Also draw the sketch of the pole mounted substation.	[20]
6.	Prepare a list of material required for giving service connection to a single storeyed building at 230V,50 HZ, single phase having a load of 5kW . The supply is to be given from a overhead line 20 metre away from building.	[20]

VI- SEM ELECTRICAL ENGG./2019(W)

EET-604-E(i) TESTING AND MAINTENANCE OF ELEWCTRICAL MACHINE

Full Marks: 80 Time : 3 Hours

Answer any FIVE Questions including Q No. 1& 2

Figures in the right hand margin indicates marks

1.	Answer ALL the questions (a) What is relay? (b) Why starter is used in DC motor? (c) What is the function of bushing in transformer? (d) What are the properties of transformer oil? (e) What is neutral earthing of Transformer? (f) While civil construction for transformer installation, what provision should be made noise level reduction? (g) What is the difference between indoor and outdoor substation? (h) Why circuit breaker is installed in substation? (i) Define maintenance and state its types. (j) Write any four tools used for maintenance?	2x10
2.	Answer any **SIX** questions (a)What are the procedures for inspection on arrival of machine before its installation? (b)What are the testing carried out before giving electric supply to machines? (c)What is breather? How charging of breather is done? (d)What are the protection circuit fitted to a power transformer? (e)Explain about the general requirements for a layout of indoor substation? (f)Discuss about various steps for installation of outdoor circuit breaker? (g)What are the advantages of preventive maintenance?	5x6
3.	Explain about generalized procedures of installation of any electrical machine?	10
4.	Discuss the various steps for commissioning and fitting of all accessories in a power transformer?	10
5.	(a) Write the steps for drying a transformer? (b) Explain the process of filling oil in transformer?	5x2
6.	Discuss about the various steps in brief for testing and commissioning of substation?	10
7.	Write Short notes any TWO (a) Electrical wiring of motors (b) Maintenance schedule of batteries in substation (c) Safety precaution in bus bar earthing connection	5x2

VI- SEM COMMON 2019(W)

HMT 601 - ENTREPRENEURSHIP & MANAGEMENT

Full Marks: 80 Time: 3 Hours

Answer any Five Questions including Q No. 1& 2

Figures in the right hand margin indicates marks

1. Answer all the questions : 2X10

   a. Define Entrepreneur.

   b. How a private company is different from public limited company? State only one difference.

   c. State the full form of OSFC & DIC.

   d. What do you mean by Journal Entry?

   e. Who maintains Stores Ledger?

   f. State the meaning of Break- Even Point.

   g. State two functions of Trade Union.

   h. What is necessity of training? State any two points.

   i. What do you mean by Partnership Deed?

   j. Who is the father of Scientific Management?

2. Answer any **six** of the following . 5x6

   i. State and explain five different features of sole trading business.

   ii. Explain some good qualities of an entrepreneur .

   iii. Define cash book. Explain different types of cash book .

   iv. What do you mean by working capital. Explain about working capital cycle.

   v. Find out break- even point in units from the following information : Fixed Cost Rs.10,000. Variable Cost @Rs.20/- per unit. Selling Price @Rs.60/-per unit.

   vi. State the meaning of Recruitment & Selection. Explain various steps in Selection.

   vii. State and explain various provisions relating to health of workers under Indian Factories Act.

3. What is Management? Explain various functions of Management. 10

4. What is Cost Sheet ? Prepare a cost sheet from the following information : 10

Direct Material	10,000	Office Expenses	3,000
Electricity Charges	5,000	Sales Managers Salary	5,000
Telephone Charges	2,000	Direct Expenses	5,000
Direct Labour	15,000	Delivery van expense	2,000
Factory Rent	3,000	Factory manager salary	3,000
Wages	3,000	Office manager salary	2,000

5. Explain Role of an Entrepreneur in Economic Development of a Country like India. 10

6. What is Industrial Sickness? State and explain various causes of Industrial Sickness. 10

7. Define MSME. State various investment limits for MSME and explain any five importance of MSME . 10