Visvesvaraya Technological University

"Jnana Sangama", Belgaum - 590 018

Registrar

Phone: (0831) 2405468
Fax : (0831) 2405467

Ref No. VTU/Aca/A6/2013-14/950 — Date: 28 APR 2014

Circular

Sub: Blow up syllabus for VIII Semester subject **10EE81 Electrical Design Estimation & Costing**

Ref: 1) Circular No. VTU/Aca/A6/2014-15/371 dated 8-4-2014
2) Recommendations of the Workshop conducted on 21-4-2014

With reference to the above this is to inform that 1-Day workshop on VIII Semester subject **10EE81 Electrical Design Estimation & Costing** of B.E. Electrical & Electronics Engineering Course was conducted in Jain College of Engineering, Belgaum on 21-4-2014 for deliberation on depth of study / coverage and preparation of blow up syllabus.

During the workshop the Blow up syllabus of the said subject was prepared and approved by the Board of Studies in Electrical & Electronics Engineering. The same is uploaded in the University website under the head **'Blow up syllabus of 10EE81 Electrical Design Estimation & Costing'** for your information and reference.

Further, it is requested to inform the concerned teaching faculty of your college to make note of contents of this circular and follow accordingly.

By order

Registrar

To
The Principals of all Engineering Colleges affiliated and the constituent Engineering College, VTU, Belgaum.

Copy to:
1. The Registrar (Eval.), VTU, Belgaum.
2. The Special Officer, VTU's Regional Offices at Bangalore, Belgaum, Gulbarga & Mysore
3. In-Charge CNC, 'Jnana Sangama', VTU, Belgaum for uploading in the website.

Electrical Design, Estimating and Costing

Blow up syllabus

Unit 1

Topics	Contents to be covered	Hours	Remarks
Unit 1			
Introduction to estimation & costing, Electrical Schedule, Catalogues	Section 1.1 to 1.4 from Text Book	1	1. **Discuss I E Rules-29,30,45,46,47, 50,51,54, 55,77and 79 only.** 2. **Question Pattern 3 sub sections All subsections to be THEORETICAL**
Market Survey and source selection, Recording of estimates, Determination of required quantity of material	Section 1.5 to 1.7 from Text Book	1	
Labor conditions, Determination of cost material and labor, Contingencies	Section 1.8 to 1.10 from Text Book	1	
Overhead charges, Profit, Purchase system	Section 1.11 to 1.13 from Text Book	1	
Purchase enquiry and selection of appropriate purchase mode, Comparative statement, Purchase orders, Payment of bills	Section 1.14 to 1.17 from Text Book	1	
Tender form, General idea about IE rule, Indian Electricity Act and major applicable I.E rules	Section 11.18 from Text Book and 1.11 of Electrical Power Distribution by Gorti Ramanmurthy,University Press Give introduction of electricity Act (Brief)	1	

Unit 2

Topics	Contents to be covered	Hours	Remarks
General rules guidelines for wiring of residential installation	Section 8.1from Text Book	1	**Question Pattern** **Two Sub-questions** **1. 1st sub question carrying 4-6 marks of theory question** **2. 2nd sub question carry 14-16 marks problem.** **Any one problem on Conduit/ Casing-Capping/ Concealed wring system** ➢ **Type 1** ➢ **To draw single line diagram,** ▪ **Load calculation** ▪ **Length of the wire & Pipe/Casing capping** ➢ **Type 2** ▪ **Line diagram** ▪ **List of materials required for given plan (Length of the Pipe/Casing capping and number of circuit) to be worked out**
Positioning of equipments, Principles of circuit design in lighting and power circuits Procedures for designing the circuits and deciding the number of circuits, Load calculations and selection of size of conductor, Selection of rating of main switch, distribution board, protective switchgear ELCB and MCB and wiring accessories	Section 8.2, 8.3, 8.4, 8.5and 8.6(*) from text Book Factor of safety 1.5 to 2.0 10 w/squre meter for illumination Line diagram to incorporate light and power circuit No schematic for residential	2	
Method of drawing single line diagram,	Electrical Estimation and Specification by Raghunath Rao/ Raghavedra Rao	1	
Selection of type of wiring	Section 2.5from Text Book		
Rating of wires and cables	Annexure standard wire gauge		
Earthling of residential Installation	Section 4.8from Text Book	1	
Sequence to be followed for preparing estimate, Preparation of detailed estimates and costing of residential installation.	Chapter 4 problem 2 Electrical Estimation and Specification by Raghunath Rao	2	

Unit 3

Topics	Contents to be covered	Hours	Remarks
Concept of commercial installation, Differentiate between electrification of residential and commercial installation	Section 5.3.1 to 5.3.3.3 from Reference Book 1	1	**Question Pattern** **Two sub questions** **1. 1st sub question to carry 4-6 marks (THEOTY question)** **2. 2nd sub question for 14-16 marks (Problem)** **Problem may be on one of the commercial Installations, such as hostels, hotels, IT firms, work-shops and schools with 2-3 storey building** **Following parameters to be considered for commercial installation-** **a. Number of sub circuits** **b. Size of cable** **c. Switch-boards & Distribution boards** **d. Length of wire required** **e. Length and size of conduit required** **f. Mounting accessories of switch board & distribution boards** **g. Length of earth wire** **h. Bus bar & bus bar chamber** **i. Material required** **Note:i) Question may be asked to calculate any 3 or 4 parameters mentioned above.** **ii) Problems from Reference Book 1**
Fundamental onsiderations for planning of an electrical installation system for commercial building	Section 5.3.4 from Reference Book 1	1	
Design considerations of electrical installation system for commercial building, Load calculation and selection of size of service connection and nature of supply	Section 5.3.5 from Reference Book 1	1	
Deciding the size of the cables, busbar and bus bar chambers, Mounting arrangements and positioning of switchboards, distribution boards main switch etc Selection of type wire, wiring system and layout	Section 5.3.5.3, 5.3.5.5 and 5.3.5.6 from Reference Book 1	1	
Earthing of the electrical installation, Sequence to be followed to prepare estimate	Section 5.3.6 from Reference Book 1	1	
Preparation of detailed estimate and costing of commercial installation.	Section 5.3.7 and problems from Reference Book 1	2	

Unit 4

Topics	Contents to be covered	Hours	Remarks
Concept of service connection, Types of service connection and their features, Method of installation of service connection,	Section 12.1 from Text Book Section 12.2 from Text Book	1	**Question Pattern** **Three sub questions** **1. 1st and 2nd sub questions carry 6-7 marks theory question** **2. 3rd sub question -numerical with 6 to 8marks** **i)Numerical to estimate materials required for either Over-head Service Line or Under-ground Service Lines** **ii)Problems from Electrical Estimation and Specification by Raghunath Rao**
Estimates of under ground and overhead service connections	Section 3.8 (a and b) and 3.10 from Electrical Estimation and Specification by Raghunath Rao	2	
Inspection of internal wiring installations, Inspection of new installations	Section 5.1from Text Book Section 5.2from Text Book	1	
Testing of installations, Testing of wiring installations	Section 5.3 from Text Book Section 5.4 from Text Book	2	
Reason for excess recording of energy consumption by energy meter	Section 5.5from Text Book		

Unit 5

Topics	Contents to be covered	Hours	Remarks
Introduction, important considerations regarding motor installation wiring	Section 9.1, 9.2from Text Book	1	**Question Pattern** **Two sub questions** **1. 1st sub question - theory question - 6 to 8 marks** **2. 2nd sub question -numerical - 12-14 marks** **3. Problems from Text Book**
Determination of input power, Determination of input current to motors, Determination of rating of cables, determination of rating of fuse	Section 9.3- 9.6 from Text Book Annexure- standard wire gauge	1	
Determination of size of Condit, distribution Board, Main switch and starter	Section 9.7 from Text Book	1	
Detailed steps for problem	Problems from Text Book	3	

Unit 6 & 7

Topics	Contents to be covered	Hours	Remarks
Introduction, Typical AC electrical power system, Main components of overhead lines	Section 10.1- 10.3from Text Book	1	**Question Pattern** **One question (Q. No.6) is on TRANSMISSION and other(Q.No.7) on DISTRIBUTION** **Two sub questions** **1. One theory sub question with 6-8 marks** **2. Numerical with 12-14 marks** **3. Problems from Text Book**
Line supports, Factors governing height of pole, Conductor materials	Section 10.4 from Text Book	1	
Determination of size of conductor for overhead transmission line, Cross arms, Pole brackets and clamps, Guys and Stays, Conductors configuration spacing and clearances	Section 10.5 from Text Book Section 10.6 from Text Book **Size of the conductor is to be mentioned in problem**	1	
Span lengths, Overhead line insulators, Insulator materials, Types of insulators	Section 10.8 to 10.14from Text Book	1	
Lightning Arrestors, Phase plates, Danger plates, Anti climbing devices, Bird guards, Beads of jumpers, Muffs, Points to be considered at the time of erection of overhead lines	Section 10.15 to10.22from Text Book	1	
Erection of supports, Setting of stays, Fixing of cross arms, Fixing of insulators, Conductor erection	Section 10.23from Text Book	1	

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Repairing and jointing of conductor , Dead end clamps, Positioning of conductors and attachment to insulators, Jumpers, Tee-offs	Section 10.29 to 10.33 from Text Book	1	
Earthing of transmission lines, Guarding of overhead lines, Clearances of conductor from ground, Spacing between conductors	Section 10.34 to 10.37 from Text Book	1	
Testing and commissioning of overhead distribution lines, Some important specifications	Section 10.38 to 10.39from Text Book	1	
Design procedure for 11kV destitution(HT line)	Section 6.4 (Procedure)Electrical Estimation and Specification by Raghunath Rao Problem no 6.5	2	
Components used in over head transmission line	Section 7.3 Electrical Estimation and Specification by Raghunath Rao		
Specification of materials used in transmission line	Section 7.5 Electrical Estimation and Specification by Raghunath Rao	1	
Design procedure for transmission liner	Section 7.6 to 7.9 Electrical Estimation and Specification by Raghunath Rao		

Unit 8

Topics	Contents to be covered	Hours	Remarks
Introduction,Classification of substation, Indoor substations, Outdoor substations, Selection and location of site for substation	Section13.2 to 13.5 from Text Book	1	**Question Pattern** **Two sub questions** **1. 1st sub question carry 6-8 marks theory question** **2. 2nd sub question carry 12-14 marks numerical on Out door/ Indoor/ Pole mounted substation (Materials and quantity with relevant sketch(Key diagram), excluding cost)** **3. Problems from Text Book**
Main Electrical Connections, Graphical symbols for various types of apparatus and circuit elements on substation main connection diagram Key diagram of typical substations	Section 13.6 to 13.8from Text Book	1	
Equipment for substation and switchgear installations, Substation auxiliaries supply, Substation Earthing	Section 13.9 from Text Book	1	
Design procedure and numerical	Section 8.3 Electrical Estimation and Specification by Raghunath Rao	3	

TEXT BOOK:

1. Electrical Installation Estimating & Costing,J.B.Gupta,VIII Edition S.K. Katria & Sons New Delhi

REFERENCE BOOKS :

1. Electrical Design Estimating and Costing, K.B.Raina S.K.Bhattacharya, New Age International
2. Electrical Wiring Estimating and Costing, Uppal, Khanna Publishers Delhi
3. I.E.Rules and Act Manuals

29/9/14

Dr. M.R. SHIVAKUMAR
Chairman-BOS in E&E Engg.
VTU, BELGAUM,
Principal,
ACS COLLEGE OF ENGINEERING
Mysore Road, Bangalore-74.