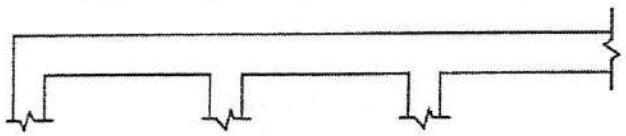
SECTION - B (CIVIL DISCIPLINE)

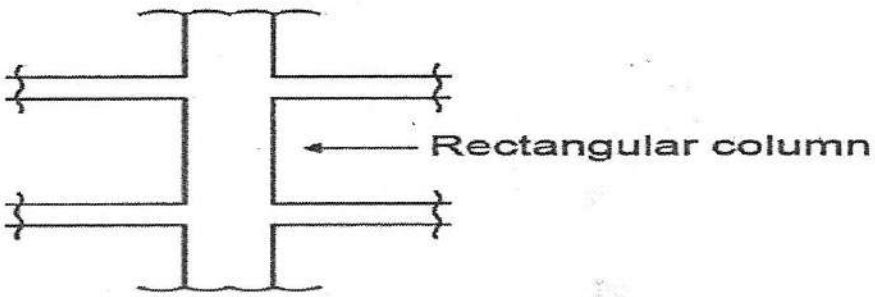
Q1. Draw a sketch showing details of steel reinforcement: -

(a)



Continuous Slab

(b)



1.5X2= 3Marks

Q2. For the network of a construction project with various activities shown below, determinethe project completion time. Mention the critical activities.

	Activity	Duration {weeks}
	1 - 2	16
	2 - 3	24
	2 - 4	36
	2 - 5	08
	3 - 5	12
	4 - 6	40
	3 - 7	32
	5 - 7	08
	6 - 7	16
	7 - 8	12

1X5=5 Marks

Q3. As part of routine quality control, a sample of three cubes is taken from a site using M30 Concrete. The cubes are appropriately cured and tested for their compressive strength. The values obtained for the three cubes are: 31 MPa, 28 MPa and 28 MPa. Based on the provision of IS 456-2000, answers the following:

(i) Does the above constitute a valid set of results from the point of view of acceptance? Justify your answer.

(ii) Is the concrete represented by the results acceptable? Clearly indicate if any additional information may be needed before final decision on acceptance is made.

2X4=8 Marks

Q4. Details of a construction project comprising of three activities are given in the following table:

S.No	Activity	Unit	Estimated quantity	Estimated rate per unit	Rate of award
1	AB	M^3	5000	1000	850
2	C	MT	4500	40000	4200
3		M^2	7000	5000	4800

Based on the information provided in the table, answer the following questions:

(i) What should be the cost of the project for which an "approval" is obtained from the competent authority before proceeding with the advertisement for the job etc.

(ii) If at a certain point of time, the work done for the activities A, B and C is 2700, 3000 and 4000 in the corresponding units, what is the percentage of the financial completion of the project?

3X2=6 Marks

Q5. A percentage rate tender was floated on 20.12.2020 for construction of 100 concrete foundation blocks as per drawing given. Using the table, showing rates of various items, given below:

(a) Calculate the estimated cost of project. Cost index on the rates indicated in the table is 90.

(b) Calculate the award price of the tender if three bidders A, B and C quoted rate 20% below, 10% above and 30% below the estimated cost respectively

S.No.	Description of items	Unit	Rate(Rs)
1	Providing and laying in position machine batched and machine mixed design mix M-25 grade cement concrete for reinforced cement concrete work.	cum	8000
2.	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete.	kg	100
3.	Brick work with common burnt clay F.P.S. (non-modular) bricks of class designation 7.5: Cement mortar 1:4 (1 cement: 4 coarse sand).	cum	7000
4.	Centering and shuttering including strutting, propping etc. and removal of form work for Columns, piers, abutments, pillars, posts and struts.	sqm	200
5.	Centering and shuttering including strutting, propping etc. and removal of form work for Foundations, footings, bases for columns	sqm	100
6.	Centering and shuttering including strutting, propping etc. and removal of form work for Slabs	sqm	400

2X4=8 Marks

Q6. From the data given below prepare the second Running Account bill of contractor 'S & K Associates' for construction of School Building'.

Description of item	Unit	Estimate dof unit Rate	Quantities orwork done upto 1st RA bill	Quantities of work done since prev. Bill
(i) Earthwork in foundation	Cum	8	3500	4000
(ii) Filling in Foundation in Lime concrete	Cum	450	300	300
(iii) Brickwork in cementfoundation	Cum	500	600	500
(iv) Brickwork in upper structure	Cum	640	500	400
(v) Rcc for Roof slab	Cum	750	400	300
(vi) Woodwork for doors &windows.	Cum	800	200	150

The other particulars are:

(a) Agreement provides for abatement of 5% over the estimated rates.

(b) Secured advance paid in the 1st RA Bill on the following materials brought to site is tobe recovered fully in 2nd RA Bill.

(i) Bricks: - 5,oo,ooo valued at Rs 700 per thousands (assessed rate)
(ii) Steel: - 30 MT valued at assessed rate of Rs 8000 per MT.

(c) The following recoveries are to be made from the second running Account Bill:-

(i) Cement: - 12MT@520 Per MT.
(ii) Water charges @ 1% of the value of work done in respect of cement work items.
(iii) Security Deposit 2.5 % and income Tax 2 %

1X5=5 Marks

Q7. Prepare a Preliminary Estimate of Civil works, namely, RCC work, internal Water Supply etc. External Civil Service connection, Local Body Approval and Third-Party Quality Assurance, for a school building of 6 floors and 1 basement, typical area of each floor/basement is 40-meter X 50-meter, basement height is 4'2 meter and 30000 liters RCC Overhead Water tank without independent staging. Also, describe the salient specifications of the building in not more than 100 words. (Plinth Area Rates to be provided).

1X5=5 Marks