ANJUMAN-I-ISLAM'S
KALSEKAR TECHNICAL CAMPUS, NEW PANVEL
School of Engineering & Technology

Subject: Irrigation Engineering	Date: 31 - 8 - 16
Marks: 20	Duration: 1 Hr
Class: BE CE 2 SEM- VII	Branch: Civil Engineering

1. Answer any five. (2x5=10)

   a. Discuss in brief the advantages of irrigation.
   b. Define duty, delta and base period.
   c. Find the delta of a crop if the duty for a base period of 100 days is 1300 ha/cumec.
   d. How can you determine the average rainfall in a catchment using Thiessen polygon method?
   e. What are the assumptions of unit hydrograph theory?
   f. Draw a single peaked hydrograph and explain its components.

2. Answer any one. (5x1=5)

   a. The base period, intensity of irrigation and duty of water for various crops under the canal system are given. Determine the reservoir capacity if the culturable command area is 40000 ha.

Crop	Base period (days)	Duty at field (Ha/cumec)	Intensity of irrigation (%)
Wheat	120	1800	20
Sugarcane	360	1700	20
Cotton	180	1400	10

   b. A water course has a culturable command area of 1200 ha. The intensity of irrigation for crop A is 40% and for crop B is 35%, both the crops being rabi crops. Crop A has a kor period of 20 days and crop B has kor period of 15 days. Calculate the discharge of the water course if the kor depth for crop A is 10 cm and for B it is 16 cm.

3. Answer any one. (5x1=5)

   a. A 3 –hour storm produced a flood hydrograph and the observations were at 3-hour intervals, starting from zero hour. The observed discharges (cumecs) are 4,9,12,18,20,16,20,10,8,6,4. Assume constant base flow 4 cumecs, determine unit hydrograph ordinates, The catchment area is 50 sq. Km.

   b. The ordinates of a 2-h unit hydrograph are given.

Time (h)	0	2	4	6	8	10	12	14	16	18	20	22
2-h UH ordinates	0	25	100	160	190	170	110	70	30	20	6	0

   Derive the ordinates of a 4-h unit hydrograph.

Subject: Irrigation Engineering
Marks: 20
Date: 31/8/16   Class Test 1
Class: B.E   (SEM-VII CBGS)

- I-Shift -

Duration: 01 Hr
Branch: Civil Engineering

Q.1 Attempt any five following   (2x5=10Marks)

a) Define Irrigation Engineering and write the need of irrigation in India
b) Write Benefits of irrigation.
c) List out various methods of surface irrigation
d) Define Duty, Delta and Base period write unit of each.
e) What is consumptive use in case of crop water requirement?
f) Define unit hydrograph and write limitation of unit hydrograph

Q. 2. Attempt any one   (5 Marks)

(a) Derive relationship between Duty Delta and Base period. Find the delta for a crop when its duty is 864 hectares/Cumec on the field, the base period of this crop is 120 days.

(a) An irrigation canal has gross command area of 80,000 hectares out of which 85% is culturable command area. The intensity of irrigation for Kharif crop is 30% and for Rabi crop is 60%. Find the discharge required at the head of the canal if the duty at its head is 800 hectares/Cumec for Kharif and for Rabi is 1700 hectares/Cumec.

Q. 3. Attempt any one   (5 Marks)

(a) The ordinates of a 3 hour unit hydrograph are given below

0	3	6	9	12	15	18	21	24	27	30
0	10	25	20	16	12	9	7	5	3	0

Find the ordinates of a 9 hour unit hydrograph for the same basin analytically. Also plot this hydrograph. What is the peak discharge in this unit hydrograph?

(b) Describe in detail with neat sketch various methods of computing average rainfall over a catchment

Sem:-VII   Unit Test:- I   Date:0 1/09/2016

Subject: - Quantity Survey, Estimation & Valuation

Marks: 20   (1st shift)   Duration:- 1hour.

Note: - Q.No.1 is Compulsory & attempt any 1 question out of remaining questions.

Q.1a) Work out the quantities of following items of work by referring drawings.   -- 08M.

(Use Centre line method).

i) P.C.C (1:2:4) in foundation. ii) UCR masonry work in foundation & Plinth.

b) Explain - Administrative Approval.   – 02M.

Q.2) a) Prepare approx.estimate for a R.C.C residential building located in Panvel.

i) Plot area = 70m x 30m   ii) FSI = 1.5   iii) Building is G + 3

iv) Consider the foundation cost as 20% of super structure cost.
v) Allow 20% of building cost for all services
vi) Allow 2.5% of overall cost for consultant fees
vii) Consider 5.0% provision for contingencies.   ---- 08M.

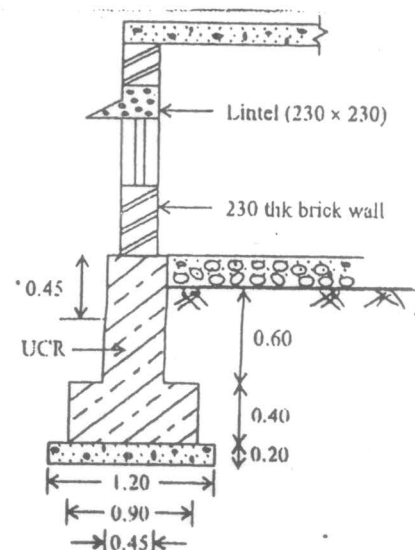**b)** Explain – Work Charged Establishments.   ---- 02M.
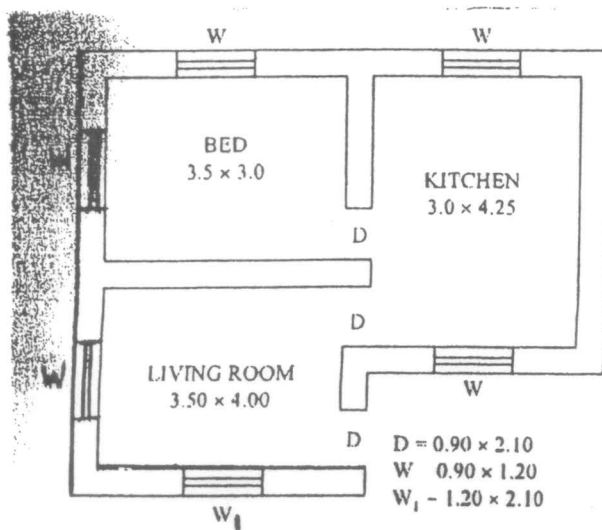
Q.3) Explain: -a) Rules for deduction while plastering. b) Approx. quantities with bill Method.
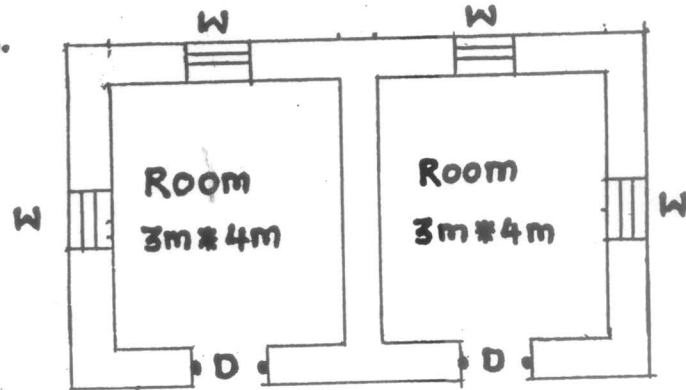
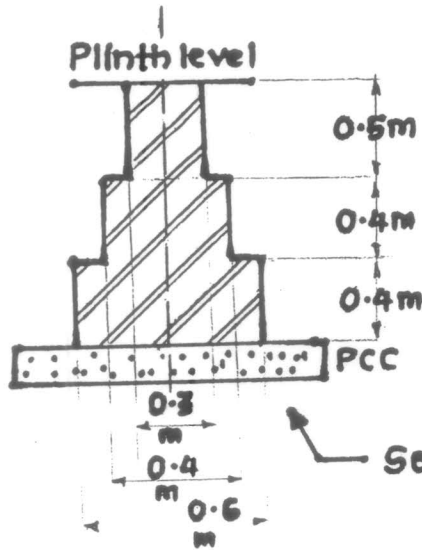c) Contingencies.   d) Bar Bending Schedule   ---- 10M.

Q.1 Using centre-line method, with reference to the Figure below, work out the quantities of following items of work: **(08 Marks)**

a) Brickwork in foundation.

b) Internal Plaster to walls.

Plinth level

0·5m

0·4m

0·4m

PCC

0·3 m

0·4 m

0·6 m

Section showing details of Brickwork in Foundation

W   W

W   Room 3m*4m   Room 3m*4m   W

D   D

PLAN

LOAD BEARING STRUCTURE.

Uniform wall thickness = 0·23 m.

D → 1·2m * 2·1m.

W → 1m * 1·2m

Q.2 Explain : a) Administrative Approval   b) Technical Sanction   **(06 Marks)**

Q.3 State the unit of measurement for :- i) Door Frames ii) Cornices. **(01 Mark)**

Q.4 Prepare a bar-bending schedule for the RCC Lintel shown in the Figure below. Assume the bearing of lintel as 15 cm on walls at each side. Take uniform concrete cover of 25mm   **(05 Marks)**

15 cm   15 cm   15 cm

1m   8mm ∅ Stirrups
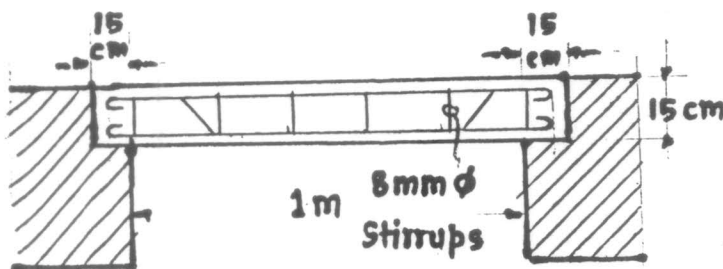
Longitudinal Section

30 cm
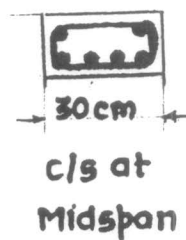
c/s at Midspan

Btm → 4 -12∅.

Top → 2 -12∅.

30 cm

c/s at support.

Btm → 2-12∅

Top → 4-12∅.

• cranking at 45°.

• Count the number of stirrups from the section.

Subject: Limit State Method of RCS	UT1	Date: 31-08-16
Marks: 20		Duration: 01 Hr.
Class: BE(VII Sem) 1st shift Staff: Dada Patil		Branch: CIVIL

INSTRUCTIONS: 1. Answer any **TWO** questions.

           2. Each full question carries **EQUAL** marks.

           3. **Assume** any suitable data, if needed.

I) Choose & write the correct option: **(A)**   (4 X1 = 04 M)

1. Percentage of steel for balanced design of a Singly Reinforced Rectangular Section by Limit State Method depends on:
   a) Characteristic strength of concrete   b) Yield strength of steel
   c) Young's modulus of steel   d) All of these

2. Maximum strain at the level of compression steel for a rectangular section having effective cover to compression steel as (d') & NA depth from compression face as (x_u) is:
   a) $0.0035 [1-(d'/x_u)]$ b) $0.002 [1-(d'/x_u)]$ c) $0.0035 [1-(x_u/d')]$ d) $0.002 [1-(x_u/d')]$

3. In the LSM design of concrete structures, the strain distribution is assumed to be:
   a) Non-linear   b) Linear   c) Parabolic   d) Parabolic & rectangular

4. $M_{u,lim}$ for a Singly Reinforced Balanced RC Rectangular beam, with Fe415 steel, is:
   a) $0.115f_{ck}bd^2$ b) $0.185f_{ck}bd^2$ c) $0.138f_{ck}bd^2$ d) $0.225f_{ck}bd^2$

(B) A rectangular beam 230 mm wide & 520 mm effective depth is reinforced with 4 bars of 16 mm diameter. Find out the depth of NA & specify the type of beam. Also find the ultimate Moment of Resistance. Use M20 concrete & Fe415 steel.   **(06 M)**

II) A Singly Reinforced Rectangular Beam of width 230 mm & 460 mm effective depth is reinforced with 3 bars of 20 mm diameter. Find the factored MR of the section. Use M20 concrete & Fe415 steel. Also find the factored MR if it is reinforced with 4 bars of 22 mm diameter.   **(10 M)**

III) **(A)** Find the factored MR of a beam section 300 mm wide X 450 mm effective depth, reinforced with 2 bars of 20 mm diameter as compression steel at an effective cover of 50 mm and 4 bars of 25 mm diameter as tension steel. Use M20/Fe415 materials. Take f_{sc} = 342 MPa.   **(06 M)**

(B) Fill in the blanks for the Limiting reinforcement Index: **(04 M)**

f_y (MPa)	250	415	500	550
Limiting Reinforcement Index	------------	------------	------------	------------

sem VII

Subject: **LSMRCS**	Date: 31-08-16
Marks:20	Duration:01Hr/s
Class: **BECE (2nd Shift)**	Branch: Civil Engineering

Note: Question No. 1 is compulsory, Attempt anyone out of remaining questions.

Q.1) Attempt any two Question   (2x5=10M)

a) What are the various assumptions made in the theory of bending of RC members at limit state of collapse?

b) Derive the expression for the ultimate moment of resistance in respect of singly reinforced rectangular beam.

c) Explain why doubly reinforced section is required.

Q.2) Attempt anyone

a) Determine ultimate moment of resistance for a singly reinforced rectangular beam of width 230 mm and 500 mm overall depth. Effective cover provided to the tensile reinforcement is 40 mm, the tensile reinforcement consist of 4 bars of 16 mm diameter. Use M20 concrete and Fe 415 steel   (10M)

b) Determine Ultimate moment of resistance of doubly reinforced rectangular section of size 300 x 550 mm (effective) having tension reinforcement of 6 bars of 25 mm and compression reinforcement of 3 bars of 20 mm diameter. Use M20 concrete and Fe415 steel. Assume 50 mm effective cover to the compression reinforcement.   (10M)

d'/d	0.05	0.1	0.15	0.20
fsc	355.1	351.9	342.4	329.2

OR

Q.2) Attempt any one

a) A T beam section having effective depth of 450 mm, flange width of 1200 mm, rib width of 300 mm, slab thickness of 120 mm. Tension reinforcement consist of 6 bars of 25 mm diameter. Determine ultimate moment of resistance of the beam section. Use M20 concrete and Fe415 steel.   (10M)

b) Design a singly reinforced beam for a factored bending moment 1×10^8 N-mm. Use M20 and Fe415 by LSM.   (10M)

Date: 1/9/2016   **Unit Test-I**   **Time: 3:00 PM-4:00 PM**

BECE-2   <u>ENVIRONMENTAL ENGINEERING-II</u>

Shift - II   **(20 Marks)**

Q 1. A) Select the most appropriate answer from the following options.

i) The ratio of minimum hourly flow to the average flow of sewage is   1 M
a) 1/3   b) 1/2   c) 2/3   d) 3

ii) A 20 cm dia sewer is laid at a slope of 0.004 and is designed to carry a discharge at a depth of 10 cm with Manning's n=0.014, the design discharge is........   2 M
a) 9.6 lit/sec   b) 19.2 lit/sec   c) 0.009 lit/sec   d) None

iii) Pickup the incorrect statement: 1 M
a) Aerobic bacteria flourish in the presence of oxygen
b) Anaerobic bacteria flourish in the absence of oxygen
c) Facultative bacteria flourish in the presence as well as in absence of oxygen
d) None of the above

iv) The graph between amounts of organic matter left in sewage and time elapsed in days, is: 1 M
a) Linear   b) Parallel to the time axis   c) Exponential   d) None

Q 1. B) Explain various sewer laying methods with the help of neat sketch.   5 M

OR

Q 1. B) Write a note on sewage pumping station.   5 M

Q 2. A) Differentiate between aerobic and anaerobic treatment of sewage.   2 M

Q 2. B) Explain Drop Manhole with the help of figure.   3 M

Q 2. C) Explain the flowing chemical characteristics of sewage: pH, DO, BOD, COD, Nitrates.   5 M

OR

Q 2. C) A sample of sewage shows 5 days $20^{\circ}C$ BOD value of 250 mg/L. What will be the ultimate BOD? What is the BOD exerted in 7 days if the reaction is carried out at $35^{\circ}C$? (K_D at $20^{\circ}C$= 0.1 /day)   5 M

Subject: <u>Environmental engineering - II</u>	Date: <u>01/09/16</u>
Marks: <u>20</u>	Duration: <u>1Hr/s</u>
Class: B.E. Shift-I UT-I	Branch: <u>Civil</u>

Instructions: 1) Question No. **1** is **Compulsory.**

2) Assume any **suitable data** but **state** the **same.**

3) Illustrate answers with **sketches** wherever **necessary.**

Q.1 Attempt **any five** of the following   (10)

A) The sewer which transports the sewage to the point of treatment is called:
I) house sewer   II) main sewer   III) outfall sewer   IV) none of these.

B) Standard 5 day BOD at 20^0c, when compared to ultimate BOD, is about:
I) 58%   II) 68%   III) 98%   IV) none of these.

C) If 2% solution of sewage is incubated for 5 days at 20^0c, and the D.O. Depletion is 10 mg/l, then the BOD of the sewage would be:
I) 50 mg/l   II) 200 mg/l   III) 500 mg/l   IV) 5000 mg/l

D) The phenomenon by virtue of which a soil is clogged with sewage matter, is   called
I) sewage farming   II) sewage sickness   III) sewage bulking   iv) none of these.

F) Acceptable noise level for residential & business urban areas as per IS:4954-1968 is:
I) 25-35 dB   II) 40-50 dB   III) 50-60 dB   IV) 70-80 dB

G) Sources of thermal pollution are:
I) Industrial effluents   II) Nuclear power plants   III) Soil erosion   IV) all of these.

Q. 2 Attempt **Any one** of the following :   (05)

A) The 5 day 30^0C BOD of sewage sample is 110mg/l. Calculate its 5 day 20^0C BOD. Assume $K_{20} = 0.1$.

B) Write a short note on Self-purification of stream

Q. 3 Solve **Any One** of the following   (05)

A) Prove that 80 dB + 80 dB ≠ 160 dB.

B) Write a short note on BOD.