ARKA JAIN University, Jharkhand

3rdSemesterFinal Examination – 2018-19

Subject : Engineering Materials & Construction

Time :3 Hours

Course: Polytechnic (Civil)
Full Marks :70
Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A, B & C**
- **Part-A** is compulsory.
- **Part- B** contains **SIX** questions out of which **FOUR** questions are to be answered.
- **Part- C** contains **SIX** questions out of which **THREE** questions are to be answered.

PART A

Q.1) **All questions are compulsory**

A] **Multiple Choice Questions :**   (10x1=10)

a) Slate is a type of:
   a) Igneous Rock
   c) Argillaceous Rock
   b) Sedimentary Rock
   d) Calcareous Rock

b) Number of bricks required for $1m^3$ of brick masonry is
   (a) 400
   (c) 500
   (b) 450
   (d) 550

c) Size of standard brick is:
   a) 19mm*9mm*9mm
   c) 200mm*100mm*100mm
   b) 20mm*10mm*10mm
   d) 190mm*90mm*90mm

d) A first class brick when immersed in cold water for 24 hours should not absorb water more than:
   a) 20%
   c) 15%
   b) 22%
   d) 25%

e) Which is not a defect of timber due to conversion?
   a) Chip Mark
   c) Diagonal Grain
   b) Torn Grain
   d) Blue Stain

f) Percentage of silica in a good brick earth lies between:
   a) 50-60%
   c) 20-30%
   b) 4-5%
   d) 5-6%

g) Excess of alumina in brick earth makes the brick:
   a) impermeable
   c) to lose cohesion
   b) brittle and weak
   d) to crack and warp on drying

h) Number of vertical joints in a stretcher course is x times the number of joints in the header course, where x is equal to
   a) 1/2
   c) 2
   b) 1
   d) ¼

i) Which is a hand tool for excavation:
   (a) Muttock
   (b) Trencher
   (c) Bulldozer
   (d) Dragline Trencher

j) A queen closer is a:
   (a) Brick laid with its length parallel to the face or direction of wall
   (b) Brick laid with its breadth parallel to the face or direction of wall
   (c) Brick having the same length and depth as the other bricks but half the breadth
   (d) Brick with half the width at one end and full width at the other

B] Very Short question

(5x2=10)

a) Enlist different grades of bricks with their compressive strength.
b) What are the types of defects caused due to fungi?
c) What is the necessity of site clearance?
d) Draw the elevation & plan of stretcher bond of ½ brick thick wall.
e) Write down the design criteria of stairs.

PART B

Q2. Answer any four:

(4x5=20)

i)   Enlist the components of Substructure and Superstructure.
ii) Differentiate between Beam & Column
iii) What are the types of tools used for soil excavation? Give atleast four examples of each.
iv) What are the properties of a good mortar?
v)   With the help of diagram, define (a) Half Bat (b) Queen Closer (c) King Closer
vi) What are Hollow Concrete Blocks? What are the advantages of cavity wall?

PART C

Answer any three:

(3x10=30)

Q.3) Enlist the types of Cracks. Explain (a) Crack due to Moisture Movement (b) Crack due to elastic deformation.

Q.4) Explain English Bond used in Brick Layout. Draw the plan and elevation of $1\frac{1}{2}$ brick thick wall to explain English Bond for Course 1, 3, 5, 7…. And Course 2, 4, 6, 8….

Q.5) Draw a well labeled diagram of Stair. What are the different types of Staircase? Draw their diagrams.

Q.6) Explain the terms related to door with a neat labeled diagram. Also enlist the different types of doors.

Q.7) Explain: (a) Guniting (b) Grouting

Q.8) What is Veneer? How it is used to make plywood? Also explain in brief about Particle Board.

Subject : Basic Surveying

Time :3 Hours

Course: Polytechnic (Civil)
Full Marks :70
Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A,B& C**
- **Part-A** is compulsory.
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- **Part- C** contains **SIX** questions out of which **THREE** questions are to be answered.

PART A

Q.1) **All questions are compulsory**

A] **Multiple Choice Questions :(10x1=10)**

a) For a well-conditioned triangle, no angle should be less than
   a) 20°   b) 30°
   c) 45°   d) 60°

b) The angle of intersection of the two plane mirrors of an optical square is
   a) 30°   b) 45°
   c) 60°   d) 90°

c) The permissible error in chaining for measurement with chain on rough or hilly ground is
   a) 1 in 100   b) 1 in 250
   c) 1 in 500   d) 1 in 1000

d) Normal tension is that pull which
   a) is used at the time of standardizing the tape
   b) neutralizes the effect due to pull and sag
   c) makes the correction due to sag equal to zero
   d) makes the correction due to pull equal to zero

e) Select the incorrect statement.
   a) The true meridians at different places are parallel to each other.
   b) The true meridian at any place is not variable.
   c) The true meridians converge to a point in northern and southern hemispheres.
   d) The maps prepared by national survey departments of any country are based on true meridians.

f) For a line AB
   a) the forebearing of AB and back bearing of AB differ by 180°
   b) the forebearing of AB and back bearing of BA differ by 180°
   c) both (a) and (b) are correct.
   d) none is correct

g) In the quadrantal bearing system, a whole circle bearing of 293° 30′ can be expressed as
   a) W23°30'N   b) N66°30'W
   c) S113°30'N   d) N23°30'W

h) The prismatic compass and surveyor's compass
   a) give whole circle bearing (WCB) of a line and quadrantal bearing (QB) of a line respectively
   b) both give QB of a line and WCB of a line
   c) both give QB of a line
   d) both give WCB of a line

(i) If the R.L. of a B.M. is 100.00 m, the back- sight is 1.215 m and the foresight is 1.870 m. R.L. of the forward station is

a) 99.345 m

b) 100.345 m

c) 100.655m

d) 101.870m

i) A series of closely spaced contour lines represents a

    a) steep slope

b) gentle slope

    c) uniform slope

d) plane surface

B] Very Short question(5x2=10)

a) What is dip of magnetic needle at (i) Equator (ii) Poles (iii) Northern Hemisphere (iv) Southern Hemisphere?

b) Enlist the types of chains.

c) Define (i) Horizontal Plane (ii) Reduced Level.

d) Define (i) Base Line (ii) Offset.

e) What is the procedure of Field Work?

PART B

Q2. Answer any four: (4x5=20)

i)   Indicate a contour map of: (a) Saddle (b) Ridge Line (c) Valley Line (d) Overhanging cliff (e) Vertical cliff.

ii)   Explain (a) Fly Levelling (b) Check Levelling

iii)   The following particulars were recorded while measuring the area of the figure using planimeter:

    a) FR and IR were 3.336 and 9.377 respectively.

    b) The tracing arm was set to the natural scale.

    c) The zero of the dial passed the index mark once in the anticlockwise direction.

    d) Constant C= 23.521

    e) The anchor point was inside the figure.

    Find the area of the figure.

iv)   Explain the working of Optical Square with the help of diagram.

v)   Differentiate between Prismatic & Surveyor Compass.

vi)   Explain the Principle of Surveying.

PART C

Answer any three: (3x10=30)

Q.3) Mark the details of survey in a double line field book:

1. Post office is 15m perpendicular from the chainage 4m to the right of chain line.
2. Road crosses obliquely from left to right at chainage 20m and 25m. Perpendicular offsets are 2m and 3m to the sides of roads from chainage 15m & 30m respectively.
3. A building is at the left of chain line with its ends at 8m and 9m at chainage of 30m & 40m respectively.
4. Total chainage is 50m.

Q.4) A 30m steel tape was standardized at a temperature of 20°C and under a pull of 10kg. The tape was used in measurement to fix a distance of 28m between two points at 40°C under a pull of 5kg. Given that the cross section area of tape is 0.02cm^2, total weight is 470g, Young's Modulus is $2.1*10^6$ kg/cm^2 and coefficient of thermal expansion is $11*10^{-6}$/°C. (a) Find the correct distance between the points (b) Find the value of pull for which the measured distance would be equal to correct distance.

Q.5) The following consecutive readings were taken with a dumpy level along a chain line at a chain line at a common interval of 15m. The first reading was at achainage of 165m where RL is 98.085. The instrument was shifted after the fourth and ninth readings:

3.150m, 2.245m, 1.125m, 0.860m, 3.125m, 2.760m, 1.835m, 1.470m, 1.965m, 1.225m, 2.390m and 3.035m.

Mark rules on a page of your notebook in the form of a level book page by using any method.

Q.6) What are the uses of a contour map? Also mention its characteristics.

Q.7) Describe the accessories used in chain surveying with the help of diagram.

Q.8) With the help of diagram, explain in detail the different types of ranging method on sloping ground.

ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2018-19

Subject : Civil Engineering Drawing

Time :3 Hours

Course: Polytechnic (Civil)
Full Marks :30
Pass Marks: 12

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A, B & C**
- **Part-A** is compulsory.
- **Part- B** contains **SIX** questions out of which **FOUR** questions are to be answered.
- **Part- C** contains **SIX** questions out of which **THREE** questions are to be answered.

PART A

(5x1=5)

Q.1) **All questions are compulsory**

(a) Drawings of buildings are drawn using ……………………….. Scale.

(b) Size of A1 size drawing sheet is …………mm * ………………mm.

(c) Number of zones for A0 sheet according to BIS is L=………. And W=……………

(d) Lines used for interior/hidden edges & surfaces are ………………………………………

(e) Representative Factor for 1cm= 100m is …………………………..

PART B

Q2. Draw a line plan of a 2BHK flat of carpet area 1200sq.ft consisting of the following: **(1x10=10)**

a) 2Bedrooms in which one bedroom is a Master Bedroom with attached W.C

b) 1 Hall and 1 Kitchen

c) 1 Balcony

d) All the doors has equal dimension and same is valid for windows and ventilators.

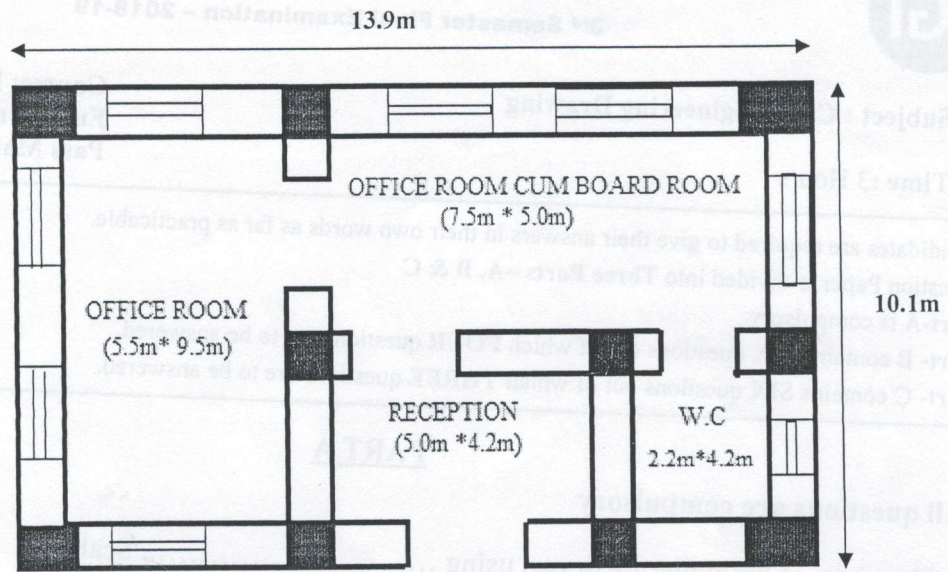e) Mention in dimensions in Feet and inches only.

PART -C

(1x15=15)

Q.3)

Draw the following plan of the following Office Building on a scale of 1:25. The necessary details are as
follows:

1. Length= 13.9m   Breadth= 10.1m
2. Thickness of wall (both outer and inner)= $1\frac{1}{2}$ brick thick
3. All the windows are of size= 1.8m*1.2m
4. All doors are of size= 0.8m*1.2m
5. Size of Ventilator= 0.4m*0.6m
6. Height of the building= 2.5m

7. Also do the zoning.

13.9m

OFFICE ROOM CUM BOARD ROOM
(7.5m * 5.0m)

10.1m

OFFICE ROOM
(5.5m* 9.5m)

RECEPTION
(5.0m *4.2m)

W.C
2.2m*4.2m

ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2018-19

Subject : Concrete Technology

Time :3 Hours

Course: Polytechnic (Civil)
Full Marks :70
Pass Marks: 28

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A, B & C**
- **Part-A** is compulsory.
- **Part- B** contains **Six** questions out of which **FOUR** questions are to be answered.
- **Part- C** contains **SIX** questions out of which **THREE** questions are to be answered.
- IS Code- 456 and IS Code- 10262 are allowed.

PART-A

Q.1)   AII questions are compulsory

A]   Multiple Choice Questions: (10x1=10)

a) The maximum amount of dust which may be permitted in aggregates is

     i)   5% of the total aggregates for low workability with a coarse grading

     ii)   10% of the total aggregates for low workability with a fine grading

     iii)   20% of the total aggregates for a mix having high workability with fine grading

     iv)   all the above

b) The bulk density of aggregates does not depend upon

     i)   size and shape of aggregates

     ii)   specific gravity of aggregates

     iii)   grading of aggregates

     iv)   size and shape of the container

c) What is workability?

     i)   When it is easily placed and compacted heterogeneous

     ii)   When it is easily placed and compacted homogenous

     iii) When it is not easily placed

     iv)   When it is easily placed but not compacted homogenous

d) What is the compaction factor for low degree of workability?

     i)   78

     ii) 85

     iii) 92

     iv) 95

e) Vicat's apparatus is used for

   i) Fineness test

   ii) consistency test

   iii) setting time test

   iv) soundness test

f) For road pavements, the cement generally used, is

   i) ordinary Portland cement

   ii) rapid hardening cement

   iii) low heat cement

   iv) blast furnace slag cement

g) While compacting the concrete by a mechanical vibrator, the slump should not exceed

   i) 2.5 cm

   ii) 5.0 cm

   iii) 7.5 cm

   iv) 10 cm

h) Slump test is done for

   i) clay

   ii) Sand

   iii) Lime

   iv) concrete

i) What is the meaning of soundness of cement?

   i) Ability to flow when mixed

   ii) Ability to make ringing noise when struck

   iii) Ability to form strong and sound structure

   iv) Ability to retain volume after setting.

j) In the soundness test, the whole assembly is immersed in water for

   i) 30 minutes

   ii) 1 hour

   iii) 24 hours

   iv) 48 hours

B] Very Short question   (5x2=10)

a) Explain the Various Properties of ordinary Portland cement.

b) What are the Properties of concrete in green and hardened stage?

c) Write the advantages of Machine mixing over hand mixing

d) Differentiate between normal and controlled concrete mix

e) Differentiate between R.C.C and P.C.C

PART B

Q2. **Answer any four:** (4x5=20)

i) What is the curing of concrete? Explain the Different methods of curing.

ii) Explain the detail the grading of concrete

iii) Explain the various factors that affects the workability of concrete

iv) Explain the Various Types of Mixers in Details, also give their capacity.

v) Define the workability of concrete. Describe the slump-test in detail.

vi) Explain in detail Pre-stressed Concrete.

PART C

Answer any three: (3x10=30)

Q.3) what is fineness modulus? Explain gap-graded aggregate with the curve.

Q.4) what are the raw materials required for manufacture of cement? Describe the procedure of determining the compressive strength of cement in laboratory.

Q.5) Define initial setting time and final setting time of cement. Describe the procedure of determining the initial setting time of cement in the Laboratory.

Q.6) Discuss the advantages of storing cement in silos as compared to storing in stocks.

Q.7) Determine the quantities of coarse Aggregate and fine Aggregate for one bag of cement to prepare a mix of 1:2:4 proportion by volume (in dry state). Consider the bulking of fine aggregate as 15%.

Q.8) Define hardness and toughness of aggregate. Describe in brief the procedure for determining the aggregate crushing value.

Subject : Engineering Economics & Accountancy

Course: Polytechnic (Civil)
Full Marks : 70
Pass Marks: 28

Time : 3 Hours

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A, B & C**
- **Part-A** is compulsory.
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PART A

Q.1) All questions are compulsory

A] Multiple Choice Questions/Fill in the blanks: (10x1=10)

i) Economics is the _____, that studies economic activities of production, consumption and transfer of wealth.

a) Social science   b) management
c) Positive science   c) Normative science

ii) The law of supply states that, 'ceteris paribus, as the price of a good _____ quantity demanded _____ .

a) Increases, increases   b) increases, decreases
c) Decreases, decreases   d) decreases, increases

iii) _____ is the situation in which quantity demanded equals quantity supplied.
a) Market equilibrium   b) Market demand
c) Market supply   d) Market shock

iv) Average Revenue is
a) P * Q   b) P*Q / Q
c) (P*Q) n – (P*Q) n-1   d) Q/ P*Q

v) If Total Revenue = 100 and Price = INR10 then, Quantity?
a) 10   c) 50
c) 1   d) 5

vi) The language of business is known as .... (accounts or engineering)

vii) The two sides of accounts is known as ....(debit and credit) or (physics and chemistry).

viii) A cash book shows the .... (cash transactions) or (non cash transactions)

ix) A cost sheet shows the total........ (cost) or (expense)

x) The two sides of a trial balance must .... (tally) or (not tally)

B] Very Short question   (5x2=10)
  a) What is demand?
  b) What is Gross domestic Product?
  c) Define: total fixed cost, total variable cost and total cost.
  d) What do you understand by the abbreviation 'TR'? and Who is the Father of Economics?
  e) What is the formula for total labour force?

PART B

Q.2). Answer any Four: (4x5=20)

  i)   Differentiate between cardinal and ordinal utility.
  ii)   Differentiate between micro economics and macro economics.
  iii)   What do you understand by the terms employment and unemployment.
  iv)   What is meant by a bank account? Explain in brief.
  v)   What is meant by debit and credit? Explain in brief.

PART C

Answer any three: (3x10=30)

Q.3) a) State the law of demand. What do you understand by individual demand and market demand?
      b) Explain the term supply. State the law of supply.

Q.4) What are the reasons behind unemployment in India?

Q.5) Explain market equilibrium will the help of demand and supply concepts.

Q.6) State the relationship between TR, MR, AR under perfect competition.

Q.7) Make a cash book...
      Opening balance Rs 100.
      Received from sales Rs 500.
      Paid rent Rs 200.
      Paid salaries Rs 300.

Q.8) Pass journal entries
      Paid Wages Rs 500
      Paid for electricity Rs 1000.
      Paid for rent Rs 2000.
      Made sales for Rs 5000.
      Received cash from Ram for Rs 1000.