ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2018-19

Subject: Engineering Material & Construction

Course: B.Tech civil

Time : 3 Hours

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-D** is compulsory

PART A

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

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

a) Which of the following has more fire resisting characteristics?
(A) Marble
(B) Lime stone
(C) Compact sand stone
(D) Granite

b) Plywood has the advantage of
(A) Greater tensile strength in longer direction
(B) Greater tensile strength in shorter direction
(C) Same tensile strength in all directions
(D) None of the above

c) Due to attack of dry rot, the timber
(A) Cracks
(B) Shrinks
(C) Reduces to powder
(D) None of these

d) Excess of alumina in brick earth makes the brick
(A) Impermeable
(B) Brittle and weak
(C) To lose cohesion
(D) To crack and warp on drying

e) Inner part of a timber log surrounding the pitch, is called
(A) Sapwood
(B) Cambium layer
(C) Heart wood
(D) None to these.

f) Advantage of a clamp compared to a kiln for burning bricks is that
(A) It takes less time for burning
(B) It gives more output of first class bricks
(C) It has less initial cost
(D) It is suitable when bricks are required in large numbers

g) Early attainment of strength in rapid hardening cement is mainly due to
(A) Gypsum
(B) Finer grinding

(C) Tri-calcium silicate
(D) Tri-calcium aluminate

h) The type of bond provided in brick masonry for carrying heavy loads is
(A) Single Flemish bond
(B) Double Flemish bond
(C) English bond
(D) Zigzag bond

i) 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] Short Answer Type **(5x2=10)**

(a) Define the term rock and stone?

(b) State the classification of rocks.

(c) Define the term dressing of stone?

(d) What is the difference between pointing and painting?

(e) Define:

1. Foundation
2. Lintel and Sill

PART B

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

QA) Explain the difference between English bond & Flemish bond.

QB) What is the purpose of plaster?

QC) Explain any five characteristics of good bricks.

QD)Define different types of windows.

QE) Explain the classification of mortar.

QF) Compare stone masonry and Brick masonry.

PART C

Answer any Three: **(3x10=30)**

Q3) What are the properties of a good timber. Explain in details the defects in timber with diagram.

Q4) What is the requirement of a good staircase. Draw the cross section of a stairs showing all its components and explaining each of them

Q5) Define Door. Explain in detail various types of doors.

Q6) List some of the flooring materials used for the construction purpose with briefly explaining its

properties..

Q7) What is scaffolding? Explain with sketches. i) Bricklayer's scaffolding ii) mason's scaffolding

Q8) Name the various types of bonds in brickwork. Explain any two bonds with neat sketches.

ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2019-20

Subject : Basic Surveying

Time : 3 Hours

Course: B.Tech civil
Full Marks : 70
Pass Marks: 28

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- 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.
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- **Part-D** is compulsory

PART A

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

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

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

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

3) 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

4) 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

5) 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.

6) 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

7) 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

8) The prismatic compass and surveyor's compass
a) give whole circle bearing (WCB) of a line and quadrantal bearing (QB) of a line respective
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

9) (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, the R.L. of the forward station is
a) 99.345 m
b) 100.345 m
c) 100.655m
d) 101.870m

10) A series of closely spaced contour lines represents a
a) steep slope
b) gentle slope
c) uniform slope
d) plane surface

B] Short Answer Type **(5x2=10)**

(a) What are the different types of chains?

(b) What are the temporary adjustment of a level?

(c) What are the different methods of contouring?

(d) What are the different methods of leveling?

(e) Distinguish between local attraction and declination

PART B

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

QA). A 30 m chain was found to be 0.20 m too long after chaining 1500m, it was found to be 0.15 m too long after chaining 2500 m. If the chain was correct before the commencement of work, find the true distance.

QB. Describe the various methods of plane tabling. Under what conditions each is preferred.

QC.) What do you understand by balancing the traverse. Describe any three methods of adjusting the traverse.

QD.) Explain the method of Collimation for reduction of level and arithmetical check.
QE.) Show with sketches the contour arrangements of the following characteristics:

i) pond ii) hill iii) vertical cliff iv) overhanging cliff

QF) what are the characteristics of contour lines?

PART C

Answer any Three: **(3x10=30)**

Q3 Write short note on

(i) Obstacle in chaining

(ii) Bench mark and it's types

Q4.) a) Give the primary classification of 'Survey' and distinguish between them.

b) Explain the chaining operation. Who is the actual surveyor- leader or the follower, why? A road $1557m$ long was found, when measured by a defective $30m$ chain, to be $1550m$. How much correction does the chain need?.

Q5.) The following data is available for a closed traverse ABCDEA

Line	Length	Bearing
AB	130	92°
BC	158	174°
CD	145	220°
DE	308	279°
EA	337	48°

Check for angular error and correct it, if necessary

Q6.) Write short notes on :

a) Rise and fall method

b) Temporary Adjustment of theodolite

Q7.) The following readings were taken in sequence during a leveling work:

1.585, 1.315, 2.305, 1.225, 1.325, 1.065, 1.815 and 2.325. The level was shifted after the 3rd and 6th readings. The 2nd change point was a bench mark of elevation 186.975. Find the RLs of the remaining stations. Use the Rise and Fall method

Q8) Explain the different conventional sign and symbols used in surveying.

ARKA JAIN University, Jharkhand

3RD Semester Final Examination – 2019-22

Subject: B.Tech Civil

Course: Fluid mechanics

Time : 3 Hours

Full Marks: 70

Pass Marks: 28

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- Question Paper is divided into **Three Parts –A, B & C**
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PART A

Q-1) All questions are compulsory

A] Multiple Choice Questions: **(10X1=10)**

i) Which of the following is a Newtonian fluid?
a) Air
b) Water
b) Both a and b
d) Grease

ii) The dampness of earth above the water surface level is due to
a) Surface tension
b) Capillary rise
b) Both
d)None

iii) Which property of liquid controls its rate of flow
a) Surface tension
b) Capillarity
b) Viscosity
d) None

iv) An ideal fluid is that fluid which
a) Has no viscosity
b) No compressibility
b) No intermolecular force of attraction
d) All the above

v) In a turbulent flow, the shear stress is mainly due to
a) Density of fluid
b) Dynamic viscosity of fluid
b) Kinematic viscosity of fluid
d) All of the above

vi) In Poiseuille flow the ratio of maximum velocity to average velocity is
a) 2.5
b) 3
b) 2
d) 4

vii) Shear stress distribution in Coquette flow is
a) Linear
b) parabolic
b) Uniform
d) none

viii) In boundary layer which of the following is associated to compensate for the reduction in flow
a) momentum thickness
b) energy thickness
b) displacement thickness
d) none

ix) Kinematic similarity means
a) similarity of motion
b) similarity of shape
b) similarity of force
d) none

x) The ratio of square root of inertia force to gravity force is called

a) Weber number b) Mach number

b) Froude number d) none

B] Very Short Questions (5X2=10)

a) Define absolute viscosity and write down its units in SI and CGS System.
b) Define laminar boundary layer and turbulent boundary layer with a diagram.
c) Define surface tension and angle of contact.
d) Explain the difference between Poiseuille and Couette flow.
e) Define geometric and kinematic similarity.

Part B

Q-2) Answer any four (4X5=20)

a) Find the minimum size of a glass tube that can be used to measure the water level rise by 5mm. Assume the surface tension of water in contact with glass as 0.073575N/m. The contact angle may be assumed to be zero.
b) Define and state Bernoulli's theorem. The reading of pressure meter attached to a closed water pipe is $35X10^4 N/m^2$. On opening the valve, the pressure reading reduces to $3X10^5 N/m^2$. Find the speed of water flowing in pipe?
c) How Bernoulli's theorem is applied to a Pitot tube to measure the velocity of flow?
d) Define and explain in boundary layer - displacement thickness and momentum thickness.
e) For the purpose of similitude discuss the three similarities which must be insured between the model and prototype.
f) In Coquette flow derive an expression for velocity distribution and show that it is parabolic.

Part C

Answer any three question:- (3X10=30)

Q-3) the space between the two square plates is filled with an oil, each side of plate is 60cm. Thickness of oil film is 15mm. The upper plate moves at 3m/s and requires a force of 100N to maintain speed. Determine the absolute viscosity in decapods and poise.

Q-4) For a Laminar boundary layer derive an expression for displacement thickness, momentum thickness and energy thickness.

Q-5) Water at 15°C flows between two large parallel plates at a distance of 1.6mm apart. Determine the maximum velocity and the pressure drop per unit length. The average velocity is 0.2 m/s and viscosity of water at 15°C is 0.01 poise.

Q-6) Explain with a diagram how flow is determined by a venturimeter using Bernouli's theorem. Also, define Co-efficient of discharge.

Q-7) Find the displacement thickness, momentum thickness and energy thickness for the velocity distribution in the boundary layer given by $\frac{u}{U} = \frac{y}{\delta}$, where u is the velocity at a distance y from the plate and u = U at y = δ where δ is the boundary layer thickness.

Q-8) A crude oil of viscosity 0.97 poise and relative density 0.9 is flowing through a horizontal circular pipe of diameter 100mm and length 10m. If the flow is viscous calculate the pressure difference at the two ends of the pipe using Poiseuille flow. 100 Kg of oil is collected in a tank in 30 seconds.

ARKA JAIN University, Jharkhand

3rd Semester Final Examination – 2018-19

Subject: Biology for engineers | **Course-B.Tech CE**
Full Marks: 70 | **Pass Marks: 28**
Time: 3Hours

- 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**
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PART A

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

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

a) The organisms which can use reduced inorganic compounds as electron donors are known as

i) Chemotropism ii) Organotrophs
iii) Lithotrophs iv) Phototrophs

b) What is the dihybrid phenotypic ratio for recessive epistasis in an F2 generation?

i) 9:3:3:1 ii) 12:3:1
iii) 9:7 iv) 9:3:4

c) A buffer solution comprises which of the following?

i) A weak acid in solution ii) A strong acid in solution
iii) A weak base in solution iv) A weak acid and its conjugate base in solution

d) Which of the following structures represents the conjugate acid of HPO_4^{2-} ?

i) $H_2PO_4^-$ ii) H_3PO_4
iii) $H_4PO_4^+$ iv) PO_4^{3-}

e) What is biomimicry?

i) A type of science ii) The act of mimicking nature for technology
iii) Copycatting nature iv) None of these

f) Transducers employed in the bulk of enzyme electrodes use which of the following principles?

i) Amperometric ii) Magnetic
iii) Optical iv) Colorimetric

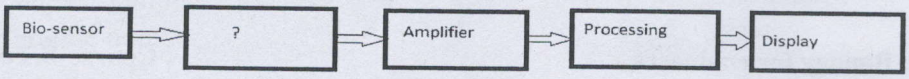
g) What is the nature of an enzyme?

i) Vitamin ii) Protein
iii) Carbohydrate iv) Lipid

h) Uricotelism is found in

i) Frogs and toads ii) Birds reptiles and insects
iii) Mammals and birds iv) Fishes and fresh water protozoans

i) Given below is the diagram of biosensor. Identify the unmarked component.



i) Microprocessor
ii) Transducer
iii) Filter
iv) A/D converter

j) When working with infectious biological material, the best place to perform the work would be

i) In a Fume Hood
ii) In a Biological Safety Cabinet
iii) On the laboratory bench
iv) On a clean bench, wearing a dust mask

B] Very Short question **(5x2=10)**

a) Uricoteliec
b) Gene mapping
c) Model organisms
d) Enzyme
e) Microbial taxonomy

PART B

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

a. Write short notes on
   i. Law of segregation and
   ii. Law of independent assortment
b. Differentiate between Incomplete dominance and codominance.
c. Define buffer? Explain the action of any one buffer.
d. Write the differences between Science and engineering.
e. Write the difference between Prokaryotic and Eukaryotic cells.
f. Write in detail of five kingdom classifications of organisms.

PART C

Answer any three: **(3x10=30)**

Q.3) What is biosensor? Describe the working principal and application of a biosensor.

Q.4) What is model organism? Describe any two model organisms.

Q.5) Write the difference between prokaryotic and eukaryotic cell.

Q.6) What is Biomimicry? Write two example of biomimicry used for civil engineering.

Q.7) Explain dominant epistasis with example?

Q.8) What is enzyme? Write the factors affecting enzyme action.