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Total Number of Pages : 04

B.Tech.
PBC2B102

2nd Semester Regular / Back Examination 2017-18

BASICS OF CIVIL ENGINEERING

**BRANCH : AEIE, AERO, AUTO, BIOMED, BIOTECH, CHEM, CIVIL,
CSE, ECE, EEE, EIE, ELECTRICAL, ENV, ETC, FAT, IEE, IT, MANUFAC,
MANUTECH, MECH, METTA, MINERAL, MINING, MME, PE, PLASTIC, PT, TEXTILE**

Time : 3 Hours

Max Marks : 100

Q.CODE : C923

Answer Part-A which is compulsory and any four from Part-B.

The figures in the right hand margin indicate marks.

Answer all parts of a question at a place.

Part – A (Answer all the questions)

Q1 Answer the following questions : *multiple type or dash fill up type* : (2 x 10)

- a) The resultant of two forces can be defined as a force that
- (a) Keeps the system in equilibrium
 - (b) Has the greatest magnitude in the system
 - (c) Has the same effect as the two forces
 - (d) Has the same effect as one forces
- b) If the two equal forces of magnitude P act an angle Θ , their resultant will be _____
- (a) $2P \cos \Theta/2$
 - (b) $P \tan \Theta/2$
 - (c) $2P \sin \Theta/2$
 - (d) $P \cos \Theta/2$
- c) The coefficient of friction (μ) is equal to _____
- (a) $\tan \Phi$
 - (b) $\sin \Phi$
 - (c) $\cot \Phi$
 - (d) $\cos \Phi$
- Where Φ = angle of friction
- d) The moment of inertia of a triangular section of base 'b' and height 'h' about an axis passing through its C.G. and parallel to the base is _____
- (a) $\frac{bh^3}{36}$
 - (b) $\frac{bh^3}{12}$
 - (c) $\frac{bh^3}{4}$
 - (d) $\frac{bh^3}{3}$
- e) Momentum _____
- (a) Is the inertia of objects in motion
 - (b) Depends on an object's velocity
 - (c) Is a vector quantity
 - (d) All of the above
- f) Crushing strength of a good building stone should be more than _____
- (a) 50Mpa
 - (b) 100 Mpa
 - (c) 150 Mpa
 - (d) 200 Mpa
- g) The accumulation of water on outer surface of concrete is _____
- (a) Transpiration
 - (b) Bleeding
 - (c) Guttation
 - (d) Ponding

- h) The curvature of the earth is taken in to account when the extent of area is more than _____
- (a) 50km^2 (b) 100km^2
(c) 150km^2 (d) 250km^2
- i) A 20m chain is divided in to _____ link and 30 m chain is divided in to _____ link.
- (a) 150 , 200 (b) 200, 150
(c) 100 , 150 (d) 150 ,100
- j) The fore bearing of a line is $S45^{\circ}30'$, _____ is its back bearing.

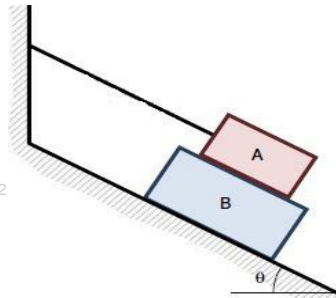
Q2 Answer the following questions : Short answer type :

(2 x 10)

- a) Uniformly distributed load of 5 kN acts on a simply supported beam of length 10 m. What are the reactions at end points of the beam?
- b) Sketch the different types of supports and the reactions developed in each type.
- c) What is the C.G of an isosceles triangle of base 20 cm and side 40 cm?
- d) State theorem of parallel axis.
- e) State law of conservation of energy.
- f) What are the different stages involved in the manufacture of bricks?
- g) Write down the different composition of ordinary cement.
- h) How are foundations classified according to their depth?
- i) What is local attraction?
- j) What are the characteristics of first class brick?

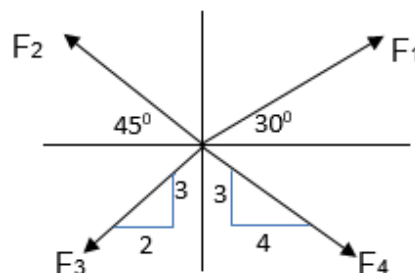
Part – B (Answer any four questions)

- Q3 a)** Block A in Fig. weighs 120 kN, block B weighs 200 kN, and the cord is parallel to the incline. (10)

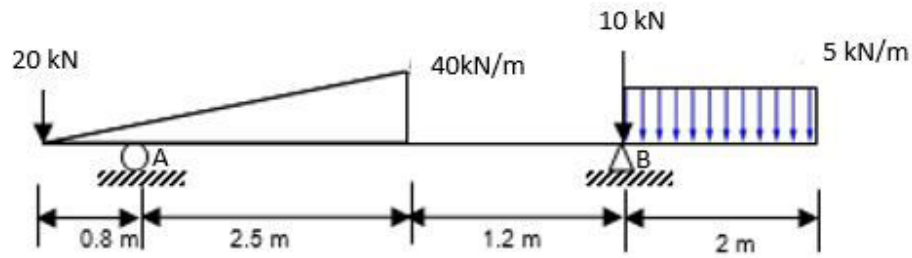


If the coefficient of friction for all surfaces in contact is 0.25, determine the angle θ of the incline of which motion of B impends.

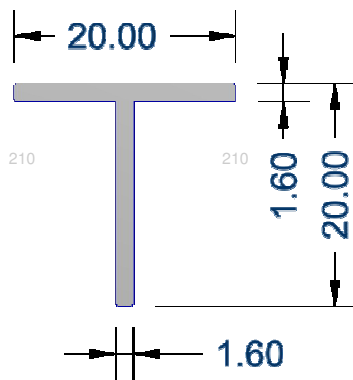
- b)** Using method of projections, find the magnitude and direction of the resultant R of the four concurrent forces shown in Fig and having the magnitude $F_1=1500\text{N}$, $F_2=2000\text{N}$, $F_3=3500\text{N}$ and $F_4=1000\text{N}$. (5)



- Q4 a)** Calculate the reactions R_a and R_b for the beam loaded as shown in Fig. Neglect weight of the beam. **(10)**

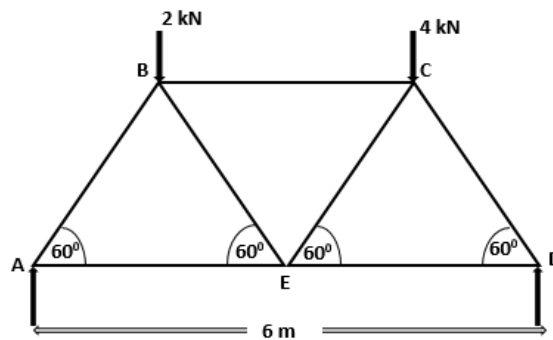


- b)** Locate the centroid of the given section. **(5)**



All the dimensions are in mm.

- Q5 a)** A Truss consisting of seven members each of 3m length freely supported at its end points. Determine the nature and magnitude of the forces in all the members. **(10)**



- b)** An arrow weighing 0.1433 N is shot from a 155.75N draw bow at full draw $d=400\text{mm}$. Assuming a linear relation between draw and force, calculate the velocity v with which the arrow leaves the bow. **(5)**

- Q6 a)** Enumerate the laboratory tests for cement and describe any two of them. **(10)**

- b)** What are the qualities of a good building stone? Discuss them. **(5)**

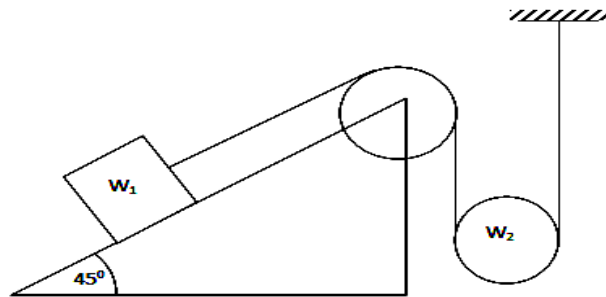
Q7 a) The following are the bearings observed in traversing, with a compass. **(10)**

Line	Fore bearing	Back bearing
AB	$68^{\circ}15'$	$248^{\circ}15'$
BC	$148^{\circ}45'$	$326^{\circ}15'$
CD	$224^{\circ}30'$	$46^{\circ}0'$
DE	$217^{\circ}15'$	$38^{\circ}15'$
EA	$327^{\circ}45'$	$147^{\circ}45'$

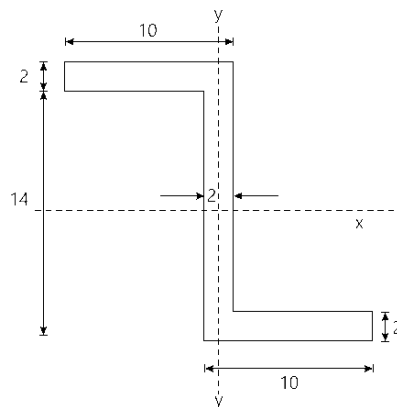
Calculate the correct fore and back bearings and the true bearings of the lines, given that, the magnetic declination is $1^{\circ}40' E$.

b) What are the types of traverse and how it checks? **(5)**

Q8 a) Find the tension S in the spring during motion of the system shown in Fig. if $W_1=890N$; $W_2=445 N$. The system is in a vertical plane, and the coefficient of friction between the inclined plane and the block W_1 is $\mu=0.2$. Assume the pulleys to be without mass. **(10)**



b) Determine the moments of inertia of the Z-section about its centroidal x and y -axes. **(5)**



Q9 Write short notes on any THREE : **(5x3)**

- Explain the different modes of transportation.
- D' Alemberts principle
- Total Station
- EDM
- Pile foundation