L-2/T-1/NAME **Date: 09/08/2017**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1 B. Sc. Engineering Examinations 2016-2017

Sub: **HUM 113** (Economics)

Full Marks: 140 Time: 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) Discuss the assumptions of perfect competition. **(6⅓)**

   (b) Explain the short run equilibrium of a firm under perfect competition. **(10)**

   (c) What is meant by the closing down point of production of a firm? Explain graphically the closing down point of production of a firm under perfect competition. **(7)**

2. (a) Discuss the various classifications of market. **(5)**

   (b) Explain the nature of demand curve under monopoly market. **(5)**

   (c) Distinguish between the concepts of fixed cost and variable cost. **(3⅓)**

   (d) Given the following total revenue (TR) and total cost (TC) functions for a firm **(10)**

   $TR = 5900Q - 10Q^2$

   $TC = 2Q^3 - 4Q^2 + 140Q + 845$

   where Q is the quantity of output.

   (i) Set up the profit function.

   (ii) Find out the quantity which makes the profit maximum.

   (iii) Calculate the maximum profit and verify that it is maximized.

3. (a) State and prove the application of Euler's theorem in the theory of distribution of production. **(10)**

   (b) Explain the concept of production function. **(3⅓)**

   (c) Discuss the various types of internal and external economies and diseconomies of scale of production. **(10)**

4. (a) Define the concept of long run. How would you derive a long run average cost (LAC) curve of a firm from its short run cost curves? Why is LAC curve often called the planning curve? **(8⅓)**

   (b) Discuss the equality between savings and investment. **(5)**

   (c) Define national income. What are the various concepts of national income? Discuss. **(5)**

   (d) Explain the product method of measuring national income of a country. **(5)**

Contd P/2

HUM 113

SECTION-B

There are **FOUR** questions in this section. Answer any **THREE**.

Symbols indicate their usual meaning.

5. (a) Clarify the concept of utility in Economies. State the assumptions of the cardinal approach to utility analysis. **(10)**

(b) Explain the law of diminishing marginal utility with numerical as well as graphical presentations. **(8)**

(c) Construct the demand curve of a commodity based on the axiom of diminishing marginal utility. **(5⅓)**

6. (a) What do you know about the fundamental economic problems and how are these problems addressed in different economic systems? Explain. **(10)**

(b) Narrate the preconditions for an effective demand in Economics. Describe the exceptions to the law of demand in your own words. **(8)**

(c) Distinguish between 'change in quantity demanded' and 'change in demand'. **(5⅓)**

7. (a) Define market demand. How would you draw a market demand curve of a commodity? **(5⅓)**

(b) Graphically explain the interactions between demand and supply of a commodity in the determination of its equilibrium price and quantity in the free market economy. **(8)**

(c) From the following demand and supply functions **(10)**

$Q_D = 1520 - 70P_X$

$Q_S = 750 + 20P_X$

Find the equilibrium price and quantity of the commodity X. If the Government imposes 15% on unit price, what will be the new equilibrium price and quantity?

8. Write short notes on any THREE of the following **(23⅓)**

(a) Factors affecting supply for a commodity

(b) Substitution effect and income effect of a price change

(c) Elasticity of demand and derivation of the formula for its measurement

(d) Indifference curve and price line.

L-2/T-1/NAME **Date: 05/08/2017**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1 B. Sc. Engineering Examinations 2016-2017

Sub : **NAME 219** (Marine Engines and Fuels)

Full Marks: 210 Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE**.

Assume reasonable value for any missing data

1. (a) "Good SI engine fuel is bad CI engine fuel" — Justify this statement. **(15)**

   (b) Amount of fuel needed for a 4 stroke, 12 cycle, 600 rpm diesel engine is 2400 lb/hp. Air consumption rate is 14 cft/lb. IHP of the engine is 6000 hp. Stroke length and diameter are 1.5′ and 15″ respectively. AFR = 22, specific gravity of fuel is 0.8, calorific value of fuel is 18000 BTU/lb. Determine the day tank capacity (15 hr), SFC, thermal efficiency, air rate and volumetric efficiency. **(20)**

2. (a) Estimate the cfm of cooling air per hp if it takes 30% of the fuel energy. Given that, η_{th} = 35%, C_p = 0.4 BTU/hp, ΔT = 130°F, specific volume of air = 13.7 cft/lb. **(18)**

   (b) What is ignition delay? List the design and operating factors that affect the delay period. **(17)**

3. (a) Demonstrate the changes of Specific Fuel Consumption (SFC) with respect to engine speed, fuel equivalence ratio and engine displacement. **(15)**

   (b) Why AFR in petrol engine is lower than in diesel engine? **(10)**

   (c) What are the differences between a wet liner and a dry liner? State their advantages and disadvantages. **(10)**

4. (a) Construct a block diagram to show the components of diesel engine fuel system and explain the requirements for feeding and injecting the fuel. **(17)**

   (b) "In SI engine knocking occurs near the end of the combustion whereas in CI engine, knocking occurs near the beginning of combustion" – explain these phenomena. **(18)**

Contd P/2

NAME 219

SECTION – B

There are **FOUR** questions in this section. Answer any **THREE**.

5. (a) What are the basic requirements of a good combustion chamber? Explain in detail. **(20)**

   (b) Write a note on L-Head type combustion chamber with necessary figures. **(15)**

6. (a) What is piston ring? What are the functions and characteristics of piston rings? **(17)**

   (b) What is induction swirl? What are the advantages and disadvantages? **(18)**

7. (a) What are the different types of CI Engine combustion chambers? Draw a classification tree. **(15)**

   (b) Compare the advantages and disadvantages between compression swirl and induction swirl. Explain in detail. **(20)**

8. (a) What is pre-combustion chamber? What are the advantages and disadvantages of pre-combustion chamber? **(15)**

   (b) Discuss elaborately the four major marine renewable energy sources and their prospects of utilization in the future. **(20)**

L-2/T-1/NAME **Date: 16/07/2017**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1 B. Sc. Engineering Examinations 2016-2017

Sub: **MATH 281** (Vector Analysis and Differential Equations (Special Types))

Full Marks: 210 Time: 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

Symbols used have their usual meaning.

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) Solve the differential equation $x^2\frac{d^2y}{dx^2}-3x\frac{dy}{dx}+4y=x+x^2\ln x$. **(17)**

   (b) Solve the following differential equation by the method based on factorization of the operator **(18)**

$$x\frac{d^2y}{dx^2}+(1-x)\frac{dy}{dx}-2(1+x)y=(1-6x)e^{-x}$$

2. Identify the nature of singular point of the differential equation **(5+30)**

$$x^2\frac{d^2y}{dx^2}+5x\frac{dy}{dx}+(x+4)y=0$$

   Hence solve this differential equation in series by Fröbenius method.

3. (a) Use the generating function of Legendre polynomials to prove **(12)**

$$nP_n(x)=(2n-1)xP_{n-1}(x)-(n-1)P_{n-2}(x)$$

   (b) Prove that $\int_{-1}^{1}P_m(x)P_n(x)dx=\frac{2}{2n+1}$ if $m=n$. Hence show that **(13+10)**

$$\int_{-1}^{1}x^2\{P_n(x)\}^2dx=\frac{1}{8(2n-1)}+\frac{3}{4(2n+1)}+\frac{1}{8(2n+3)}$$

4. (a) Prove that $x\frac{d}{dx}[J_n(x)]=nJ_n(x)-xJ_{n+1}(x)$. **(12)**

   (b) Prove that $\int_0^1 xJ_n(\alpha x)J_n(\beta x)dx=\begin{cases}0 & \text{if } \alpha\neq\beta\\ \frac{1}{2}[J_{n+1}(\alpha)]^2 & \text{if } \alpha=\beta\end{cases}$ **(13+10)**

   where α and β are the roots of $J_n(x)=0$.

SECTION – B

There are **FOUR** questions in this section. Answer any **THREE**.

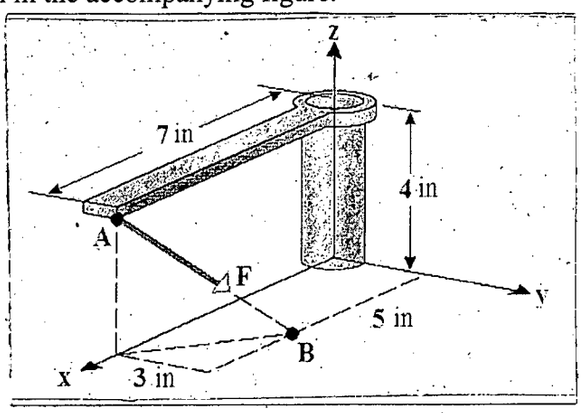
5. (a) If $\vec{u}$, $\vec{v}$ and $\vec{w}$ are linearly independent then test whether the given set of vectors $\vec{u}+\vec{v}-2\vec{w}$, $\vec{u}-\vec{v}-\vec{w}$, $\vec{u}+\vec{w}$ are linearly dependent or not. **(10)**

   (b) Find the set of reciprocal vectors to the three vectors $2\hat{i}-3\hat{j}+\hat{k}$, $\hat{i}-\hat{j}-\hat{k}$ and $-\hat{i}+2\hat{j}+2\hat{k}$. **(15)**

Contd P/2

MATH 281/NAME
Contd... Q. No. 5

(c) Suppose that a force $\vec{F}$ with a magnitude of 9 lb. is applied to the lever-shaft assembly shown in the accompanying figure. **(10)**



(i) Express the force $\vec{F}$ in component form.

(ii) Find the magnitude of vector moment of $\vec{F}$ about the origin.

6. (a) If $\vec{a}$ is expressed as the sum of two vectors $\vec{c}$ and $\vec{d}$, respectively along and perpendicular to $\vec{b}$, show that $\vec{c} = \frac{(\vec{a}.\vec{b})\vec{b}}{b^2}$ and $\vec{d} = \vec{a} - \frac{(\vec{a}.\vec{b})\vec{b}}{b^2}$ where b is the magnitude of vector $\vec{b}$. **(15)**

(b) For the space curve $x = 3t$, $y = 3t^2$ and $z = 2t^3$, find the curvature and torsion at $t = 1$. **(10)**

(c) Prove the following identities, assuming that all derivatives involved exist and are continuous. Here **(10)**

$$\vec{F} = \vec{F}(x, y, z) \text{ and } \varphi = \varphi(x, y, z).$$

(i) $div(curl\vec{F}) = 0$ (ii) $curl(\varphi\vec{F}) = \varphi\, curl(\vec{F}) + \nabla\varphi \times \vec{F}$.

7. (a) Find the values of the constants a, b, c such that the directional derivative of $\phi = axy^2 + byz + cz^2x^3$ at (1,2,–1) has a maximum magnitude 64 in the direction parallel to z-axis. **(20)**

(b) Prove that $\vec{F} = (y^2\cos x + z^3)\hat{i} + (2y\sin x - 4)\hat{j} + (3xz^2 + 2)\hat{k}$ is a conservative force field. Find the scalar potential for $\vec{F}$. **(10)**

(c) If $\vec{c_1}$ and $\vec{c_2}$ are constant vectors and λ is a constant scalar, show that $\vec{H} = e^{-\lambda x}(\vec{c_1}\sin\lambda y + \vec{c_2}\cos\lambda y)$ satisfies the partial differential equation $\frac{\partial^2\vec{H}}{\partial x^2} + \frac{\partial^2\vec{H}}{\partial y^2} = \vec{0}$. **(5)**

8. (a) Evaluate $\oint_C (x^2 - 2xy)dx + (x^2y + 3)dy$ around the boundary C of the region bounded by $y^2 = 8x$ and $x = 2$ by using Green's theorem. **(20)**

(b) Consider the vector field given by $\vec{F} = (x - z)\hat{i} + (y - x)\hat{j} + (z - xy)\hat{k}$. Use Stokes' theorem to find the circulation around the triangle with vertices $A(1,0,0)$, $B(0,2,0)$ and $C(0,0,1)$ oriented counterclockwise looking from the origin toward the first octant. **(15)**

L-2/T-1/NAME **Date: 16/08/2017**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1 B. Sc. Engineering Examinations 2016-2017

Sub: **MME 293** (Shipbuilding Materials)

Full Marks: 210 Time: 3 Hours

The figures in the margin indicate full marks.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) An Aluminium rod is to withstand an applied force of 45,000 pounds. To assure a sufficient safety, the maximum allowable stress on the rod is limited to 25,000 psi. The rod must be at least 150 inch long but must deform elastically no more than 0.25 inch when the force is applied. Design an appropriate rod. (Given, $E = 10 \times 10^6$ psi) **(12)**

   (b) What do you understand by strain hardening? **(5)**

   (c)Draw the engineering stress-strain curve for a brittle material and a ductile material. With the help of necessary figures, explain the changes, a ductile material experiences when tensile loading continues beyond yield point upto fracture. **(18)**

2. (a) Compare and contrast ductile failure and brittle failure. **(8)**

   (b) What do you understand by ductile to brittle transition? How can this phenomenon be measured? Explain the effect of crystal structure, interstitial atom and grain size on the ductile to brittle transition curve of steel. **(15)**

   (c) With the help of various S-N curves explain fatigue limit, fatigue strength and fatigue life. **(12)**

3. (a) What is continuous casting? With the help of a schematic figure, discuss the operation process of a continuous casting machine in steelmaking process. **(17)**

   (b) Write a short note on (i) high speed tool steel and (ii) maraging steel. **(4×2=8)**

   (c) What are the main raw materials in iron making process? Briefly mention their major functions in the iron making process. **(10)**

4. (a) Which non destructive testing method would you prefer to apply to reveal internal cavities in a large steel casting? Give reasons and outline the principles of your selected method. **(15)**

   (b) Classify cast iron according to their metallographic structure. Describe the method of producing malleable (ferritic) cast iron from white cast iron. **(20)**

Contd P/2

MME 293

SECTION-B

There are **FOUR** questions in this section. Answer any **THREE**.

5. (a) Distinguish between phase and element. **(6)**

(b) Using the equilibrium diagram shown in Fig. 1, answer the following questions for an alloy of 70%Pb-30%Sn: **(15)**

(i) Calculate the fractions of pro-eutectic *a* and eutectic *a* at just above and below the eutectic temperature respectively.

(ii) Draw microstructures of the alloy at 300°C, 225°C and room temperature.

(c) Non-equilibrium cooking generally results in a cored structure — explain. **(14)**

6. (a) What is the purpose of surface hardening? Explain how a hard surface on a low carbon steel would be produced. **(20)**

(b) Compare diffusional transformation with martensitic transformation. **(10)**

(c) Determine the approximate tensile strength of an annealed steel sample containing 25% ferrite and 75% pearlite. **(5)**

7. (a) Select and describe an annealing heat treatment process suitable for toughening hyper-eutectoid steel. **(15)**

(b) Mention the effect of tempering temperature on structure and mechanical properties of a quenched carbon steel part. **(14)**

(c) How hardenability of steel can be increased? **(6)**

8. (a) Sketch and level the microstructural changes that occur in hypo-eutectoid steel during equilibrium cooling from 900°C to room temperature. **(18)**

(b) Normalized hypo-eutectoid steel has higher hardness as compared to annealed hypo-eutectoid steel of same composition — explain. **(12)**

(c) Why eutectoid steel has no pro-eutectoid phase in its microstructure? **(5)**

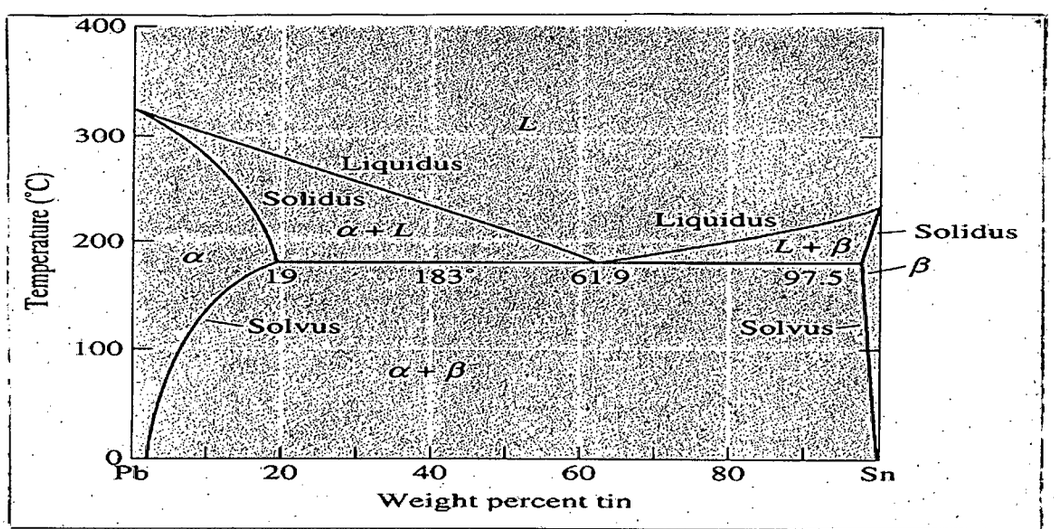


Fig. 1 for Question 5(b)

L-2/T-1/NAME **Date: 20/08/2017**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1 B. Sc. Engineering Examinations 2016-2017

Sub: **NAME 251** (Mechanics of Structure)

Full Marks: 210 Time: 3 Hours

The figures in the margin indicate full marks.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) Distinguish between ductility and brittleness. How can you measure the ductility of a material? **(10)**

   (b) Derive the relationship between **(10)**

   (i) Engineering stress and true stress, and

   (ii) Engineering strain and true strain.

   (c) What should be the total depth of the cast iron T section as shown in figure for Q. No. 1(c) in order to produce simultaneously occurring tensile and compressive stresses of 55 and 110 MPa at A and B respectively? **(15)**

2. (a) Determine the shear force and bending moment as functions of x for the cantilever beam as shown in figure for Q. No. 2(a) that supports a concentrated load and a segment of uniform load. **(15)**

   (b) A simple beam AB is loaded by two segments of uniform load and two horizontal forces acting at the ends of a vertical arm as shown in figure for Q. No. 2(b). Draw the shear force and bending moment diagrams for this beam. **(20)**

3. (a) The state of plane stress at a point is represented by the stress element as shown in figure for Q. No. 3(a). Determine the principal stresses and draw the corresponding stress element. **(15)**

   (b) A 8-m beam simply supported at the ends carries a uniformly distributed load of 12 kN/m over its entire length. What is the lightest W shape beam that will not exceed a flexural stress of 120 MPa? Also find the actual maximum stress in the beam selected. **(20)**

4. (a) Derive an expression for the angle of twist produced by torque in a solid circular shaft. **(15)**

   (b) A steel shaft and aluminum tube are connected to a fixed support and to a rigid disk as shown in figure for Q. No. 4(b). Knowing that the initial stresses are zero, determine the minimum torque T_0 that may be applied to the disk if allowable stresses are 120 MPa in the steel shaft and 70 MPa in the aluminum tube. Use G = 80 GPa for steel and G = 27 GPa for aluminum. **(20)**

Contd P/2

NAME 251

SECTION-B

There are **FOUR** questions in this section. Answer any **THREE**.

5. (a) The cross section of the 10 m long steel flat bar AB has a constant thickness of 20 mm, but its width varies as shown in Figure for Q. No. 5(a). Calculate the elongation of the bar due to 100 kN axial load. Use E = 200 GPa. **(15)**

(b) The beam shown in Figure for Q. No. 5(b) is held in position by cable AB and CD and by the pin at E. Determine the force in AB and CD due to the 500 kN force applied as shown. Beam BE is assumed not to bend and to be negligible weight. **(20)**

6. (a) A beam ABCD is supported by a roller at A and a hinge at D. It is subjected to the loads shown in Figure for Q. No. 6(a), which act at the ends of the vertical members BE and CF. These vertical members are rigidly attached to the beam of B and C. Compute the support reactions. **(20)**

(b) Determine the forces in members BD, BE and CE of the truss as shown in Figure for Q. No. 6(b). **(15)**

7. (a) Determine by the double integration method the slope and elastic curve equations for a simple beam uniformly loaded. Also find the maximum deflection. Assume E and I of the beam constant. **(17)**

(b) Develop the slope and deflection equations for the beam as shown in Figure for Q. No. 7(b). **(18)**

8. (a) Explain the following: **(6)**

   (i) Buckling,

   (ii) Critical buckling stress, and

   (iii) Slenderness ratio.

(b) Derive Euler's column formula. **(15)**

(c) Determine the moment of inertia of the shaded area as shown in Figure for Q. No. 8(c) with respect to the centroidal axes that is parallel to the side AB. **(14)**

Contd....P/3

L-2/T-1/NAME

20/8/17

NAME 251

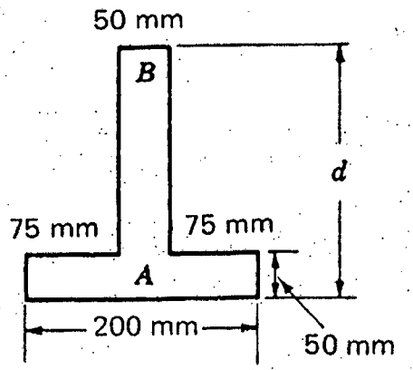


Figure for Q. No. 1(c)

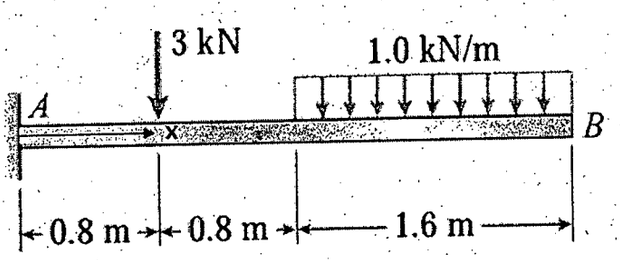


Figure for Q. No. 2(a)

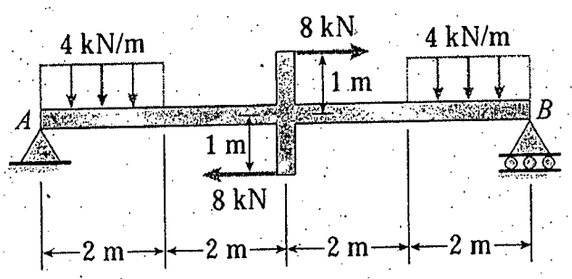


Figure for Q. No. 2(b)

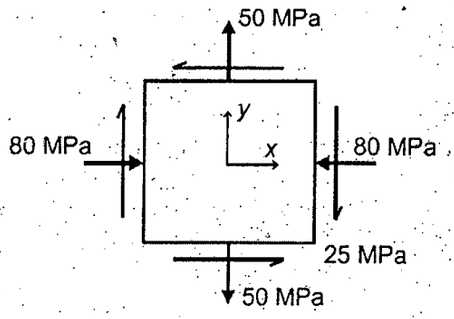


Figure for Q. No. 3(a)

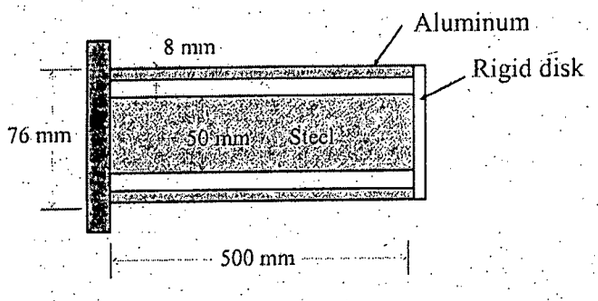


Figure for Q. No. 4(b)

Contd. P/4

L-2/T-1/NAME (20/8/17) NAME 251

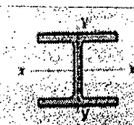
W Shapes
Wide-Flange I-Beams

SI Units

Section Number	Mass kg/m	Area mm²	Depth mm	Width mm	thickness		x-x axis			y-y axis		
					Web mm	Flange mm	I_x 10^6 mm⁴	S_x 10^3 mm³	r_x mm	I_y 10^6 mm⁴	S_y 10^3 mm³	r_y mm
W610 x 155	155	19,800	611	324	12.7	19.0	1,290	4,220	255	108	667	73.9
x 140	140	17,900	617	230	13.1	22.2	1,120	3,630	250	45.1	392	50.2
x 125	125	15,900	612	229	11.9	19.6	985	3,220	249	39.3	343	49.7
x 113	113	14,400	608	228	11.2	17.3	875	2,860	247	34.3	301	48.8
x 101	101	12,900	603	228	10.5	14.9	764	2,530	243	29.5	259	47.8
x 92	92	11,800	603	179	10.9	15.0	646	2,140	234	14.4	161	34.9
x 82	82	10,500	599	178	10.0	12.8	560	1,870	231	12.1	136	33.9
W460 x 106	106	13,500	469	194	12.6	20.6	488	2,0600	190	25.1	259	43.1
x 97	97	12,300	466	193	11.4	19.0	445	1,910	190	22.8	236	43.1
x 89	89	11,400	463	192	10.5	17.7	410	1,770	190	20.9	218	42.8
x 82	82	10,400	460	191	9.91	16.0	370	1,610	189	18.6	195	42.3
x 74	74	9,460	457	190	9.02	14.5	333	1,460	188	16.6	175	41.9
x 68	68	8,730	459	154	9.14	15.4	297	1,290	184	9.41	122	32.8
x 60	60	7,590	455	153	8.00	13.3	255	1,120	183	7.96	104	32.4
x 52	52	6,640	450	152	7.62	10.8	212	942	179	6.34	83.4	30.9
W410 x 100	100	12,700	415	260	10.0	16.9	398	1,920	177	49.5	381	62.4
x 85	85	10,800	417	181	10.9	18.2	315	1,510	171	18.0	199	40.8
x 74	74	9,510	413	180	9.65	16.0	276	1,330	170	15.6	173	40.5
x 67	67	8,560	410	179	8.76	14.4	245	1,200	169	13.8	154	40.2
x 53	53	6,820	403	177	7.49	10.9	186	923	165	10.1	114	38.5
x 46	46	5,890	403	140	6.99	11.2	156	774	163	5.14	73.4	29.5
x 39	39	4,960	399	140	6.35	8.8	126	632	159	4.02	57.4	28.5
W360 x 101	101	12,900	357	255	10.5	18.3	302	1,690	153	50.6	397	62.6
x 91	91	11,600	353	254	9.5	16.4	267	1,510	152	44.8	353	62.1
x 79	79	10,100	354	205	9.40	16.8	227	1,280	150	24.2	236	48.9
x 64	64	8,150	347	203	7.75	13.5	179	1,030	148	18.8	185	48.0
x 57	57	7,200	358	172	7.87	13.1	160	894	149	11.1	129	39.3
x 51	51	6,460	355	171	7.24	11.6	141	794	148	9.68	113	38.7
x 45	45	5,710	352	171	6.86	9.8	121	688	146	8.16	95.4	37.8
x 39	39	4,960	353	128	6.48	10.7	102	578	143	3.75	58.6	27.5
x 33	33	4,160	349	127	5.84	8.5	82.9	475	141	2.91	45.8	26.4

W Shapes
Wide-Flange I-Beams

SI Units



W310 x 107	107	13,600	311	306	10.9	17.0	248	1,590	135	81.2	531	77.3
x 97	97	12,300	308	305	9.90	15.4	222	1,440	134	72.9	478	77.0
x 86	86	11,000	310	254	9.10	16.3	199	1,280	135	44.5	351	63.6
x 74	74	9,480	310	205	9.40	16.3	165	1,060	132	23.4	228	49.7
x 67	67	8,530	306	204	8.51	14.6	145	948	130	20.7	203	49.3
x 39	39	4,930	310	165	5.84	9.7	84.8	547	131	7.23	87.6	38.3
x 33	33	4,180	313	102	6.60	10.8	65.0	415	125	1.92	37.6	21.4
x 24	24	3,040	305	101	5.59	6.7	42.8	281	119	1.18	23.0	19.5
x 21	21	2,680	303	101	5.08	5.7	37.0	244	117	0.986	19.5	19.2
W250 x 101	101	12,900	264	257	11.9	19.6	164	1240	113	55.5	432	65.6
x 80	80	10,200	256	255	9.40	15.6	126	984	111	43.1	338	65.0
x 67	67	8,560	257	204	8.89	15.7	104	809	110	22.2	218	50.9
x 58	58	7,400	252	203	8.00	13.5	87.3	693	109	18.8	185	50.4
x 45	45	5,700	266	148	7.62	13.0	71.1	535	112	7.03	95	35.1
x 28	28	3,620	260	102	6.35	10.0	39.9	307	105	1.78	34.9	22.2
x 22	22	2,860	254	102	5.84	6.9	28.8	227	101	1.22	23.9	20.7
x 18	18	2,280	251	101	4.83	5.3	22.5	179	99.3	0.919	18.2	20.1
W200 x 100	100	12,700	229	210	14.5	23.7	113	987	94.3	36.6	349	53.7
x 86	86	11,000	222	209	13.0	20.6	94.7	853	92.8	31.4	300	53.4
x 71	71	9,100	216	206	10.2	17.4	76.6	709	91.7	25.4	247	52.8
x 59	59	7,580	210	205	9.14	14.2	61.2	583	89.9	20.4	199	51.9
x 46	46	5,890	203	203	7.24	11.0	45.6	448	87.9	15.3	151	51.0
x 36	36	4,570	201	165	6.22	10.2	34.4	342	86.8	7.64	92.6	40.9
x 22	22	2,860	206	102	6.22	8.0	20.0	194	83.6	1.42	27.8	22.3
W150 x 37	37	4,730	162	154	8.13	11.6	22.2	274	68.5	7.07	91.6	38.7
x 30	30	3,790	157	153	6.60	9.3	17.1	218	67.2	5.54	72.4	38.2
x 22	22	2,860	162	152	5.84	6.6	12.1	159	65.0	3.87	50.9	36.8
x 24	24	3,060	160	102	6.60	10.3	13.4	168	66.2	1.83	35.9	24.5
x 18	28	2,290	163	102	5.84	7.1	9.19	120	63.3	1.26	24.7	23.5
x 14	14	1,730	150	100	4.32	5.5	6.84	91.2	62.9	0.914	18.2	23.0

Cont D/5

NAME 25|
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L-2|T-1|NAME

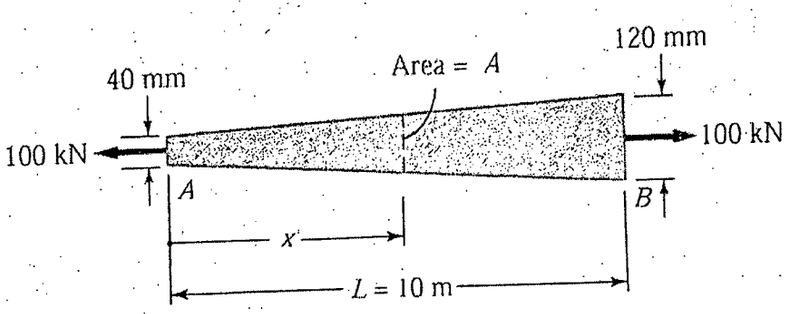

Figure for Q. No: 5(a)

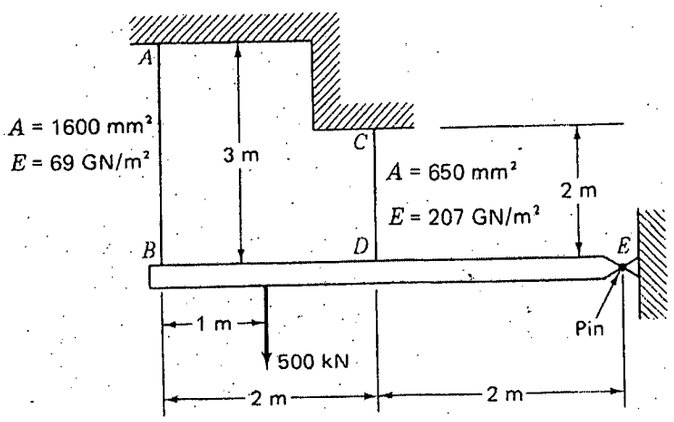

Figure for Q. No. 5(b)

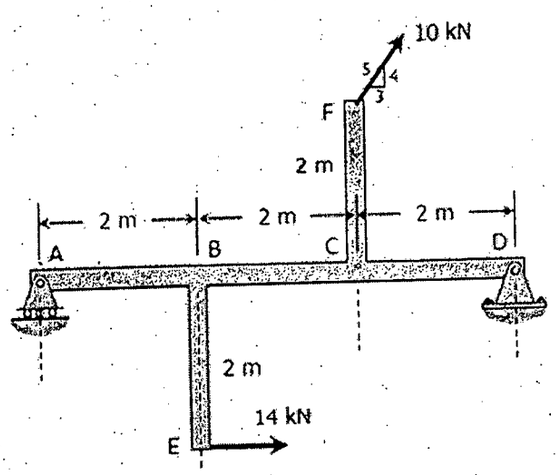

Figure for Q. No. 6(a)

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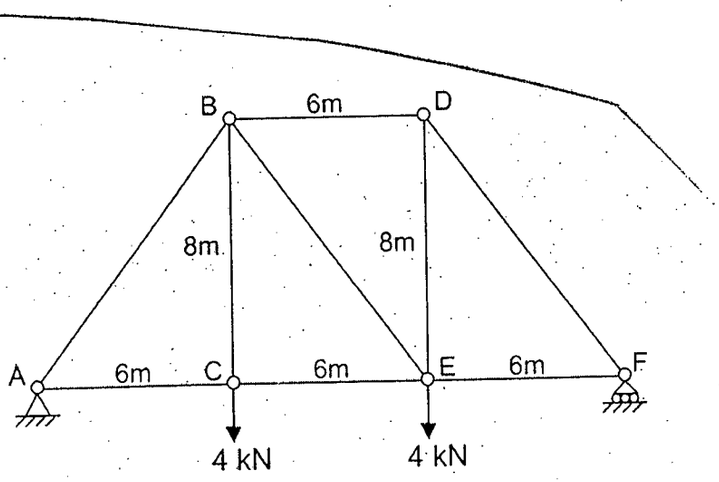

Figure for Q. No. 6(b)

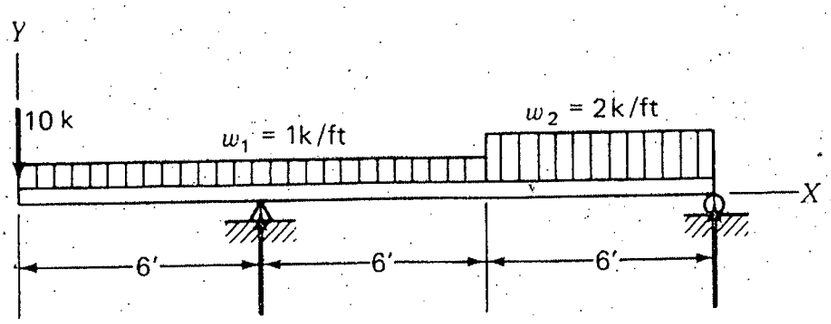

Figure for Q. No. 7(b)

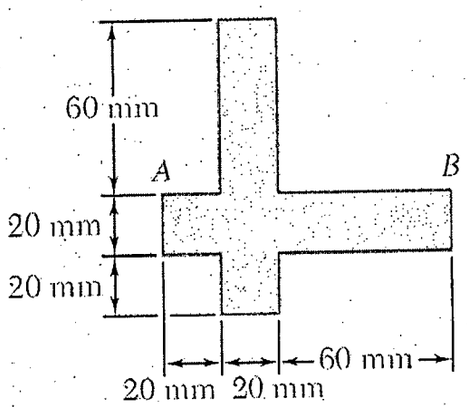

Figure for Q. No. 8(c)