L-3/T-1/ME Date : 23/01/2012

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 B. Sc. Engineering Examinations 2010-2011

Sub : **ME 341** (Machine Design I)

Full Marks: 210 Time : 3 Hours

The figures in the margin indicate full marks.

Students are allowed to use Machine Design Handbook-1.

Assume reasonable value for missing data, if there is any.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

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

1. (a) A simple carbon steel beam of rectangular section (h = 3b) is subjected to the loadings, as shown in Fig. 1(a). If the midspan deflection of the beam is not to exceed 0.5 mm, determine the dimensions using Castigliano's theorem. Neglect direct shear. **(17)**

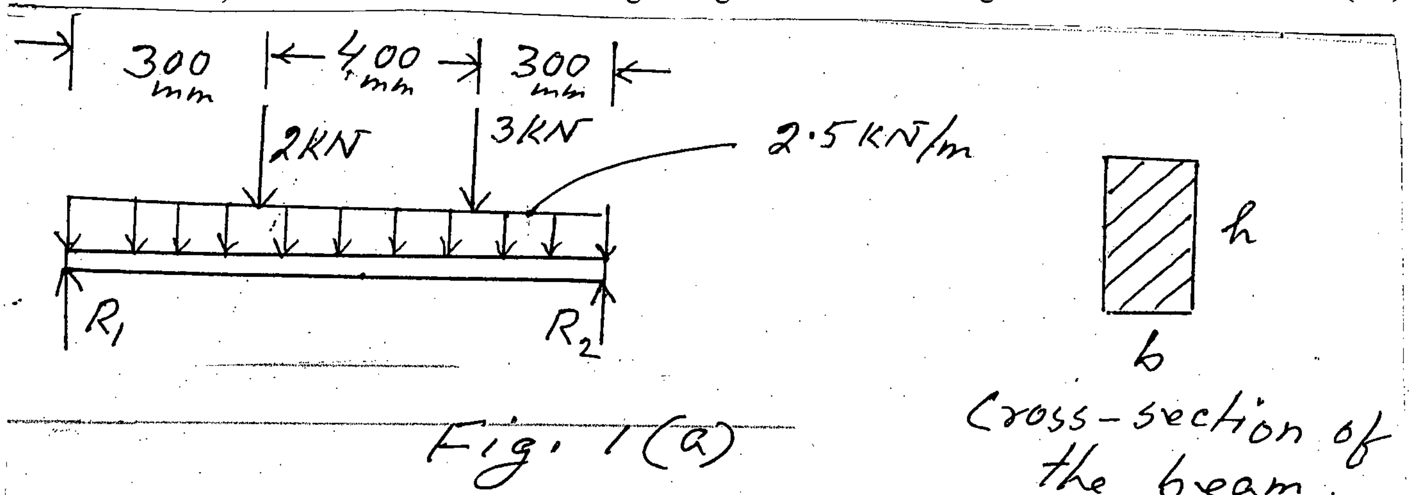

Fig. 1(a)

(b) A lever is subjected to the loadings, as shown in Fig. 1(b). The round bar is made of BS 080M40 hardened and tempered steel. Determine the diameter of the round bar "d" based on a factor of safety of 1.75 using distortion energy theory. Consider F = 4.5 kN and P = 3.5 kN. (All dimensions in Fig. 1.(b) are in millimeters). **(18)**

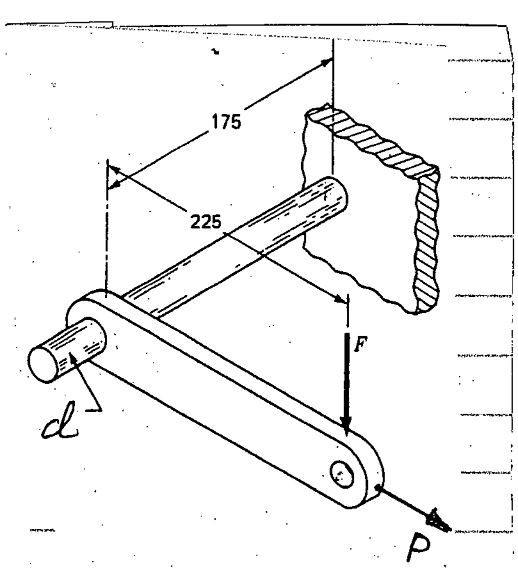

Fig. 1(b)

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2. (a) A cylinder contains pressurized gas at 500 MPa and has the outer and inner diameters of 600 mm and 450 mm respectively. Determine the maximum permissible radial crack dimension on the outer surface of the cylinder in order to avoid further propagation of crack based on safety factor of 2.0. The cylinder material is BS 816M40 of yield strength 1515 MPa. **(18)**

(b) Find the weld size of the welded joint, as shown in Fig. 2(b), if the permissible shear stress for the welds is 180 MPa and F = 90 kN. All bars are 12 mm thick. **(17)**

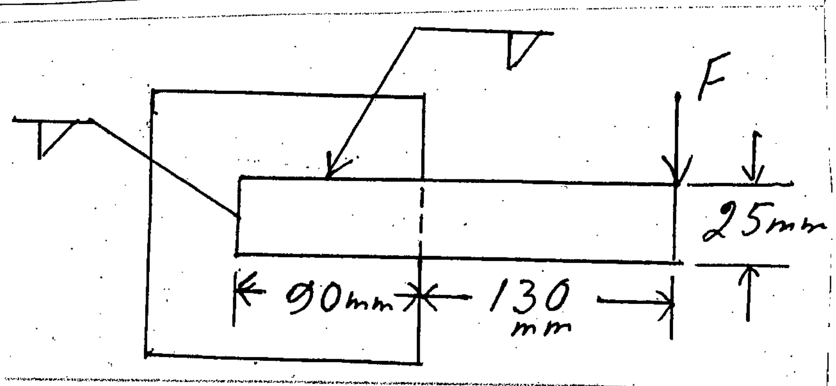

Fig. 2(b)

3. (a) A forged flat bar (thickness = 3.0 cm) with notches is subjected to reversed bending moment, as shown in Fig. 3(a). The material of the bar is BS 945M38 steel, hardened and tempered to 230 BHN. For an operating temperature of 390^0 and a reliability of 95 percent, find the life of the bar. Consider r = 2.5 cm, W = 15 cm and the applied bending moment M = 5 kN-m. **(17)**

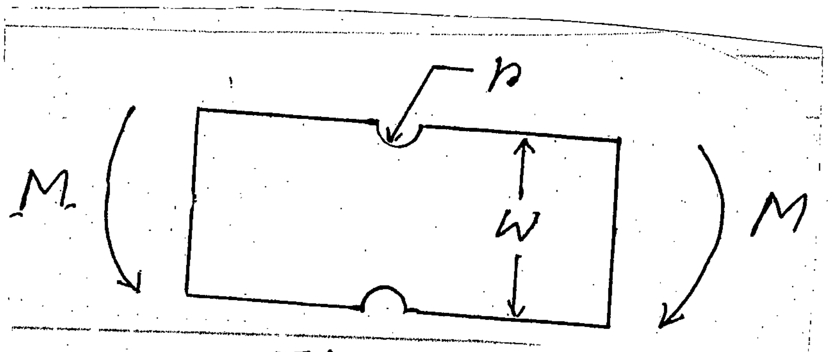

Fig. 3(a)

(b) The connecting rod, as shown in Fig. 3(b), is machined from a 10 mm thick bar of BS 080M30 cold drawn steel. The bar is axially loaded by completely reversed forces acting on pins through the two drilled holes. Based on infinite life, 90 percent reliability and a factor of safety of 2.0, estimate the maximum safe reversed axial load that can be applied. (All dimensions in Fig. 1.(b) are in millimeters). **(18)**

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Contd .... Q. No. 3(b)

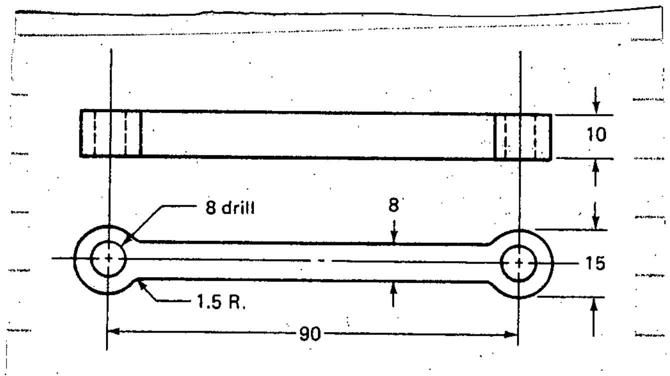

Fig. 3(b)

4. (a) A pressure vessel, as shown in Fig. 4(a), is to be sealed using a copper asbestos having dimensions as follows: A = 150 mm, B = 230 mm, C_1 = 25 mm, C_2 20 mm, D = 5 mm and E = 290 mm. The cylinder head is carbon steel and the cylinder is BS 180 gray cast iron. The head is to be fastened down using M12 × 1.75 metric hexagonal bolts (regular). Find the stiffness of the bolt and the members. **(18)**

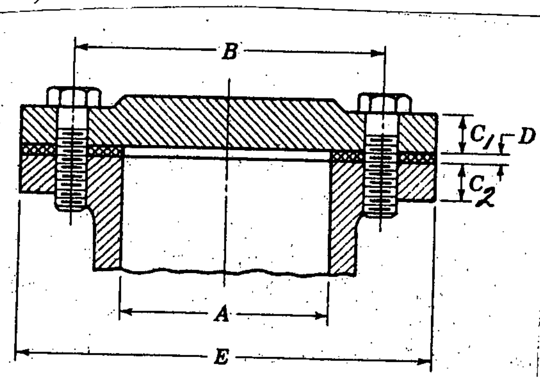

Fig. 4(a)

(b) A 10 mm thick cantilever bar made of BS 708M40 steel, hardened and tempered to 250 BHN supports a static load of 6.5 kN, as shown in Fig. 4(b). The bar is secured with a steel column (thickness = 12 mm) using five M12 × 1.25 steel bolts of grade 9.8. Find the factors of safety for the following modes of failures: **(17)**

(i) based on maximum bearing stress

(ii) based on critical bending stress in the bar.

All dimensions in Fig. 4.(b) are in millimeters.

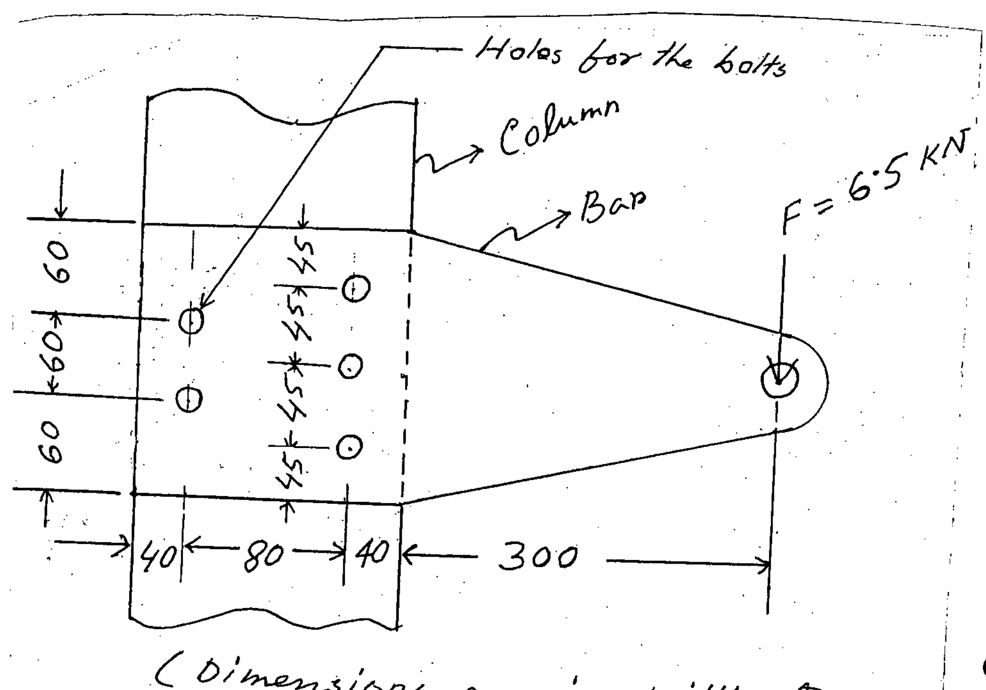

Fig. 4(b)

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SECTION – B

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

5. (a) An overhanged beam of length 9 m made of BS 080M30, hot rolled, is subjected to an alternating load F = 20 kN as shown below. Determine the dimension t considering safety factor of 4.0 based on ultimate strength. **(20)**

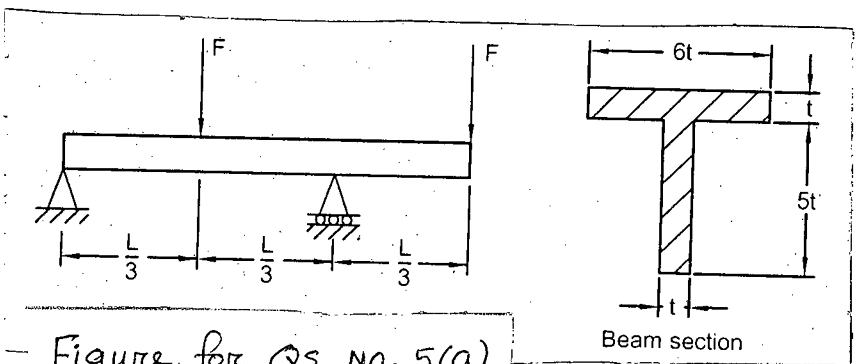

Figure for Qs. No. 5(a)

(b) A 20 mm diameter rolled is in contact with a plate-cam surface whose width is 12 mm and the radius of curvature of the cam surface is 85 mm. If the Hertz compressive stress is not to exceed 2000 MPa, determine the maximum load that can be applied. If the follower has the plane flat surface keeping other parameter same as above, what is the maximum load hat can be applied? **(15)**

6. A 250 mm long column supports an axial load of 15 kN which passed through the C.G of the cross-section of the column as shown below. The column is fixed at one end and free at the other end. The column material is BS 070M20 cold drawn (s_y = 385 MPa). **(35)**

(a) Determine dimension t considering Johnson's formula based on factor of safety of 3.

(b) If the column is made into a hollow circular cross-section with the same section area and thickness t as found in (a), determine factor of safety and make necessary comment.

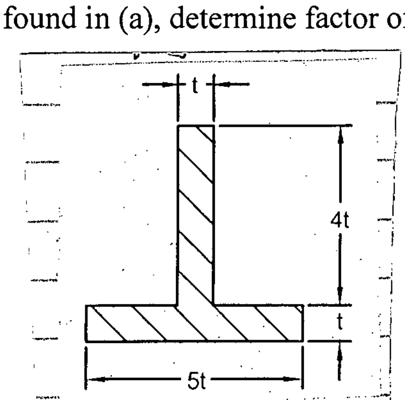

Figure for Qs. No. 6

7. (a) A shaft with a nominal diameter of 100 mm is to fit in a hole. Specify the allowance, tolerances and limit diameter of the shaft and hole on a sketch for a free running fit. Use hole basis system. **(15)**

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Contd .... Q. No. 7

(b) A C-frame is subjected to a load P = 2.5 kN as shown below. If the design normal stress is limited to 40 MPa, Determine dimension t. **(20)**

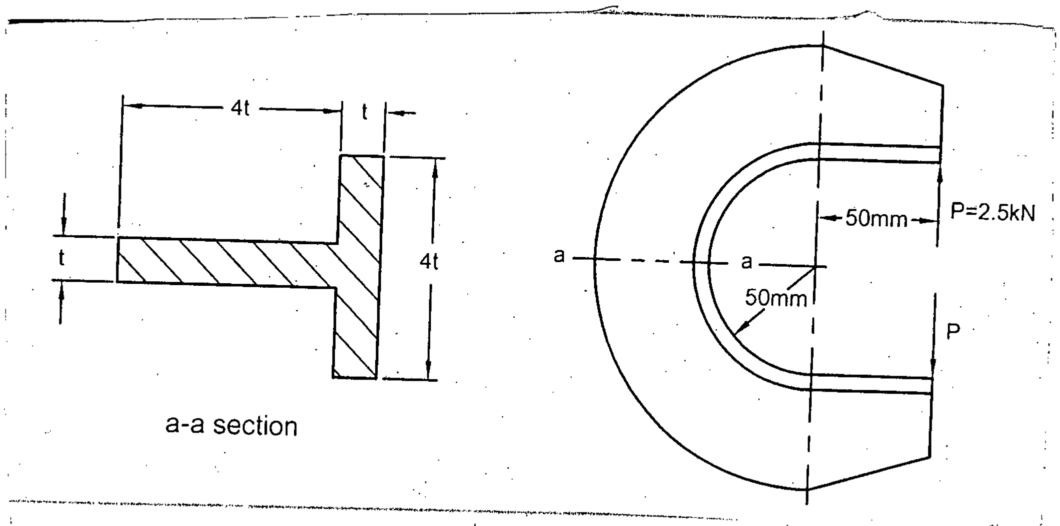


Figure for Qs. No 7(b)

8. (a) A manufacturer supplies 2000 springs to a company according to the specification having spring of 1000 ± 100 N/m. If the number of unacceptable spring in the whole lot is 25, determine the standard deviation of the lot. **(15)**

(b) A C-frame of a hand screw press is made of BS 080M50 hardened and tempered steel and has a section similar to that shown in the figure below. A force F of 50 kN acts normal to the plane of the section at a distance of 300 mm from the inside face. Determine the dimensions of the section. Consider factor of safety of 6.0 based on ultimate strength. **(20)**

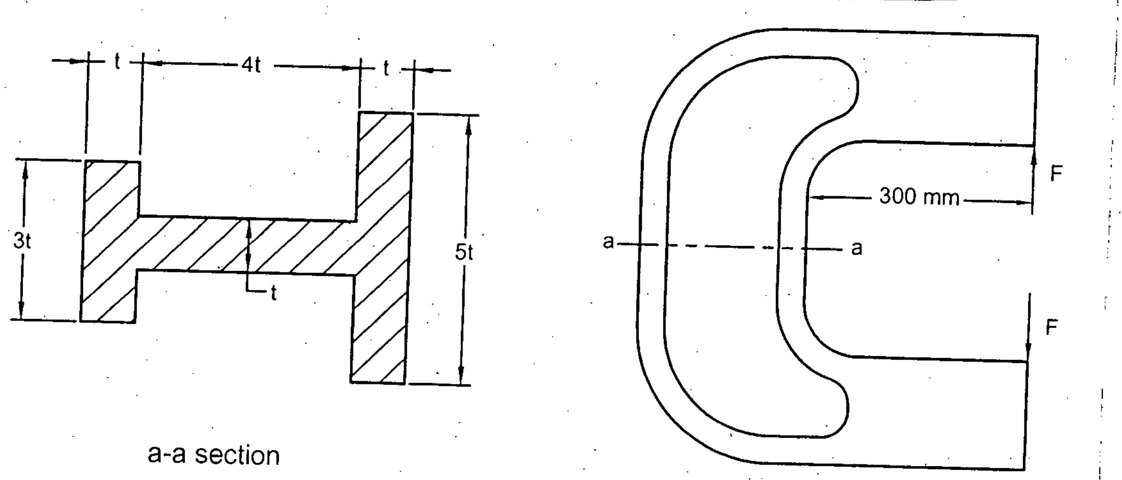


Figure for Qs. No. 8(b)

L-3/T-1/ME **Date : 31/01/2012**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 B. Sc. Engineering Examinations 2010-2011

Sub : **ME 361** (Instrumentation and Measurement)

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) What do you mean by beat frequency and hetrodyning? Describe with sketches and examples. **(10)**

   (b) Sketch three special waveforms of harmonic nature and describe their practical application and important features. **(09)**

   (c) What do you mean by step input to measurement? Make differences between delay, reisetime and slewrate. **(09)**

   (d) What is 'Discrete Fourier Transform'? Describe. **(7)**

2. (a) Write down the differential equation of a harmonically excited second order system. Mention its specific characteristics. **(10)**

   (b) What do you mean by critical damping? Show the time-displacement relations for damped motion and describe. **(10)**

   (c) What is Nyquist frequency? Mention its importance in sampling data. **(08)**

   (d) Describe the working principle of seismic instrument. **(07)**

3. (a) Mention the application of an operational amplifier with the help of a sketch show the typical connections of an operational amplifier. **(10)**

   (b) What do you mean by CMMR? Mention its physical significance. **(06)**

   (c) What do you mean by 'gauge factor'? Derive an expression for 'gauge factor' of a resistance strain gouge. **(12)**

   (d) Write down the desirable properties of the material of a resistance strain gouge. **(07)**

4. (a) With the help of a block diagram describe the working principle of a multichannel datalogger. **(15)**

   (b) Name the general functions of signal conditioning stages of measurement system and discuss. **(08)**

   (c) Describe the working principle of water brake dynamometer. **(06)**

   (d) What do you mean by Proving ring? Mention its application. **(06)**

Contd P/2

SECTION – B

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

5. (a) Make differences between variable inductance and variable reluctance transducers. **(10)**

   (b) What is piezoelectric effect? In which type of applications are the piezoelectric sensors suitable? Describe the working principle of a piezoelectric transducer with proper sketches. **(15)**

   (c) What is photoemissive transducer? Show the circuits of a photovoltaic cell. **(10)**

6. (a) Define dynamic pressure, stagnation pressure and static pressure. **(5)**

   (b) Name different types of pressure transducer. **(5)**

   (c) Briefly explain the working principle of a LVDT-Diaphragm Differential pressure gauge. **(10)**

   (d) Briefly describe the working principle of a McLeod gage. **(15)**

7. (a) Make differences between pitot tube and pitot-static tube. **(5)**

   (b) A venturi placed in a 25 cm diameter line passing 2.5 m^3 of water per minute. If the throat diameter is 12.5 cm, what differential pressure may be expected across the pressure taps? **(15)**

   (c) Briefly explain the working principle of Variable-Area meter for flow measurement. Discuss its advantages and disadvantages. **(15)**

8. (a) Compare the principle and performance of RTD and thermistor. **(10)**

   (b) State and illustrate the laws of thermocouple. Which type of thermocouple you should choose to measure a gas flame temperature in the order of 500°C and why? **(10)**

   (c) What is an IC temperature sensor and where it is used? **(5)**

   (d) Briefly explain describe a method for measuring very high temperature. **(10)**

L-3/T-1/ME **Date : 01/03/2012**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 B. Sc. Engineering Examinations 2010-2011

Sub : **ME 345** (Mechanics of Machinery)

Full Marks: 280 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) A certain machine requires a torque of (1400 + 200 sinθ) N-m to drive it, where θ is the angle of rotation of its shaft measured from some datum. The machine is direct-coupled to an engine which produces a torque of (1400 + 250 sin2θ) N-m. **($22\frac{2}{3}$)**

The flywheel and other rotating parts attached to the shaft have a mass of 320 kg, with radius of gyration 400 mm. The mean speed is 160 rev/min. Calculate: (i) the percentage of fluctuation of speed; (ii) the maximum angular acceleration of the flywheel.

(b) The turbine rotor of a ship has a mass of 20,000 kg, and a radius of gyration of 0.6 m and rotates at 3000 rev/min. The ship is pitching 10° above and 10° below the horizontal, the motion being simple harmonic and having a period of 12s. The rotor turns in a clockwise direction when viewed from aft. Determine: **(24)**

(i) the maximum angular velocity of the ship during pitching;

(ii) the maximum angular acceleration of the ship during pitching;

(iii) the maximum value of the gyroscopic couple, stating its plane of action;

(iv) the direction of yaw as the bow rises.

2. A cam with a minimum radius of 50 mm, rotating clockwise at a uniform speed is to be designed to give a roller follower motion described below. **($46\frac{2}{3}$)**

(i) To rise the follower through 25 mm during 120° rotation of the cam.

(ii) To keep the follower fully raised through next 30° of cam rotation.

(iii) To lower the follower during next 60°, and

(iv) To dwel the follower for the rest of the cam rotation.

The diameter of the roller is 15 mm and the diameter of the cam shaft is 25 mm. Draw the profile of the cam when the line of stroke of the follower rod is offset by 15 mm from the axis of the cam shaft and the motions of the follower rod are simple harmonic while being raised and of uniform acceleration while being lowered.

Contd P/2

3. A straight rod PQ, 180 mm long, forms part of a mechanism as shown in Figure for Question No. 3. The end P of the rod is constrained to move in a straight vertical path with simple harmonic motion, making 5 complete oscillations per second. The travel of P between extreme positions is 60 mm. The rod PQ slides in a small swivel block pivoted at a fixed point O. Point O is situated 60 mm to the right, and 60 mm below the mean position of the point P. At an instant when P is 15 mm below the center of the line of stroke, and is moving upwards, determine: **($46\frac{2}{3}$)**

   (a) the velocity and acceleration of sliding of the rod through the swivel block;

   (b) the angular velocity and angular acceleration of the rod.

4. (a) For maximum power transmission by a flat belt, prove that the linear speed of the belt is $\sqrt{\frac{T}{3m}}$, where, T = maximum tension in the belt and m = mass of the belt per unit length. **($23\frac{2}{3}$)**

   (b) A rope drive is required to transmit 230 kW from a pulley of 1 m diameter running at 450 rev/min. The safe pull in each rope is 800 N and the mass of the rope is 0.46 kg/m. The angle of lap and the groove angle are 160° and 45° respectively. If the coefficient of friction between the rope and the pulley is 0.3, find the number of ropes required. **(23)**

SECTION – B

There are **FOUR** questions in this Section. Answer any **THREE**.
Symbols have their usual meaning. Assume reasonable values for missing data if this any.

5. (a) An epicyclic train as shown in figure 5(a) has internal gear A and is keyed to the driving shaft and has 30 teeth. **(23)**
   Compound wheel C and D of 20 and 22 teeth respectively are free to rotate on the pin fixed to the arm P which is rigidly connected to the driven shaft. Internal gear B which has 32 teeth is fixed. If the driving shaft runs at 50 rpm clockwise, determine the speed of the driven shaft. What is the direction of rotation of driven shaft with reference to driving shaft.

   (b) Figure 5(b) shows the braking system with two brake shoes which act on the internal surface of a cylindrical brake drum. The braking forces F_1 and F_2 are applied as shown and each shoe pivots on its fixed fulcrum O_1 and O_2. The width of the brake lining is 35 mm. The intensity of pressure at any print A is 0.4 Sinθ N/mm^2 when θ is measured as shown. The coefficient of friction is 0.4. Determine the Braking torque and the magnitude of the forces F_1 and F_2. **($23\frac{2}{3}$)**

Contd P/3

6. (a) The reciprocating masses of the first three cylinders of a four cylinder engine are 4.1, 6.2, and 7.5 tones respectively. The centre lines of the three cylinders are 5.2 m, 3.2 m and 1.5 m from the fourth cylinder. If the cranks for all the cylinders are equal determine the reciprocating mass of the fourth cylinder and the angular position of the cranks such that the system is completely balanced for the primary force and couple. If the cranks are 0.8 m long, the connecting rods 3.8 m, and the speed of the engine 75 rpm, find the maximum unbalanced secondary force and the crank angle at which it occurs. **(26)**

   (b) A, B, C, and D four masses carried by a rotating shaft at radii 100 mm, 150 mm, 150 mm and 200 mm respectively. The planes in which the masses rotate are spaced at 500 mm apart and the magnitude of the masses B, C and D are 9 kg, 5kg and 4 kg respectively. Find the required mass A and the relative angular position of the four masses so that the shaft shall be in complete balance. **($20\frac{2}{3}$)**

7. (a) Figure 7(a) shows a pair of uniform parallel beam AB, 1.2 m long and together of mass 8 kg, an hinged at A and supported at B by a single spring of stiffness 4.5 kN/m. The beams carry a fly wheel D of mass 28 kg in bearing 0.9 m from A. When in static equilibrium, AB is horizontal. Find the natural frequency of vibration of the system.
   If the centre of gravity of the fly wheel is 3 mm from its axis of rotation. Find the total vertical movement of B when the flywheel rotates at 200 rev/min. **(23)**

   (b) A steel shaft 15 mm diameter is beld in bearings 1 metre apart and carries at its middle a disc of mass 15 kg. The accentricity of the centre of gravity of the disc-from the centre of the rotor is 0.30 mm. The modulus of elasticity for the shaft material is 200 GN/m^2 and the permissids stress is 70 MN/m^2. Determine (1) The critical speed of the shaft and (2) The range of speed over which it is unsafe to run the shaft. (neglect the mass of the shaft) **($23\frac{2}{3}$)**

8. (a) A machine part of mass 2 kg vibrates in a viscous medium. Determine the damping coefficient when a harmonic exciting force of 25 N results in a resonant amplitude of 12.5 mm with a period of 0.2 second. If the system is excited by a harmonic force of frequency 4 Hz, what will be the percentage increase in the amplitude of vibration when damper is removed as compared with that with damping? **(23)**

   (b) A uniform shaft 85 mm diameter carries three rotors A, B, and C having moments of inertia of 17, 40 and 24 kg m^2 respectively. The distance between A and B is 0.75 m and between B and C 1.35 m. Find the frequency of the tree tensional vibration. If the retor has an amplitude of 1° in each case. Find the amplitudes of B and C,. The modulus of rigidity of the shaft is 80 GN/m^2.

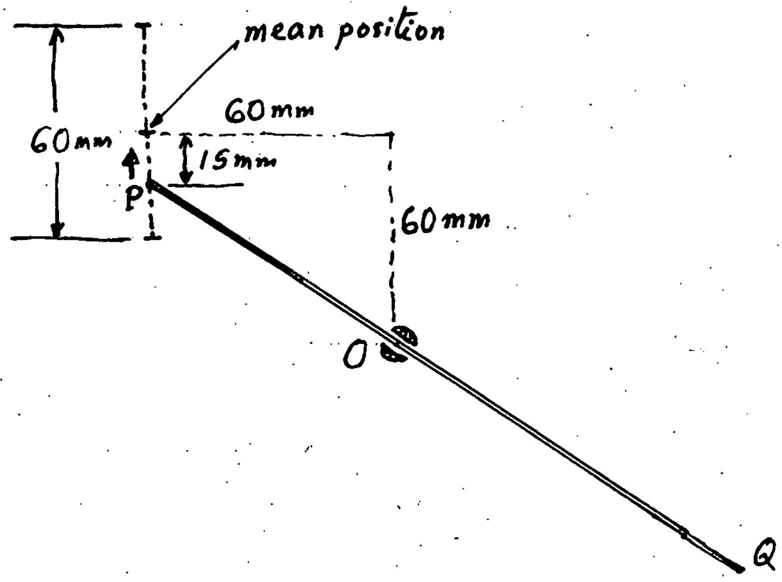


Figure for Question No. 3

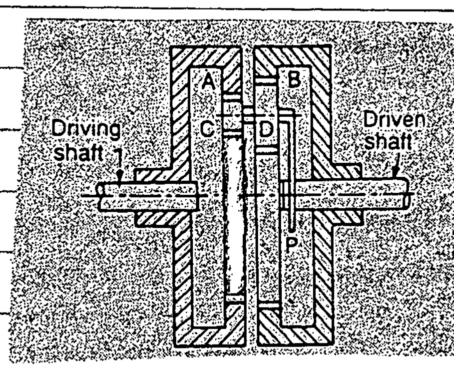


Figure 5(a) for Ques. No. 5(a)

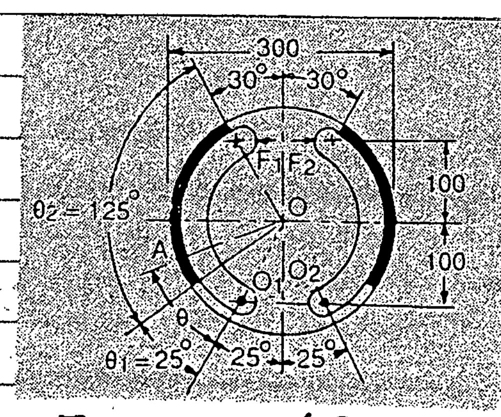


Figure 5(b) for Ques. No 5(b)

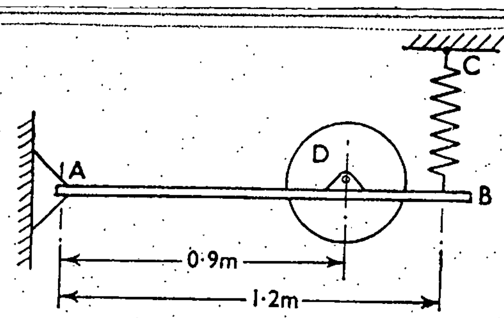


Figure 7(a) for Ques. No. 7(a)

L-3/T-1/ME Date : 23/02/2012

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-3/T-1 B. Sc. Engineering Examinations 2010-2009

Sub : **ME 301** (Conduction and Radiation Heat Transfer)

Full Marks: 210 Time : 3 Hours

The figures in the margin indicate full marks.

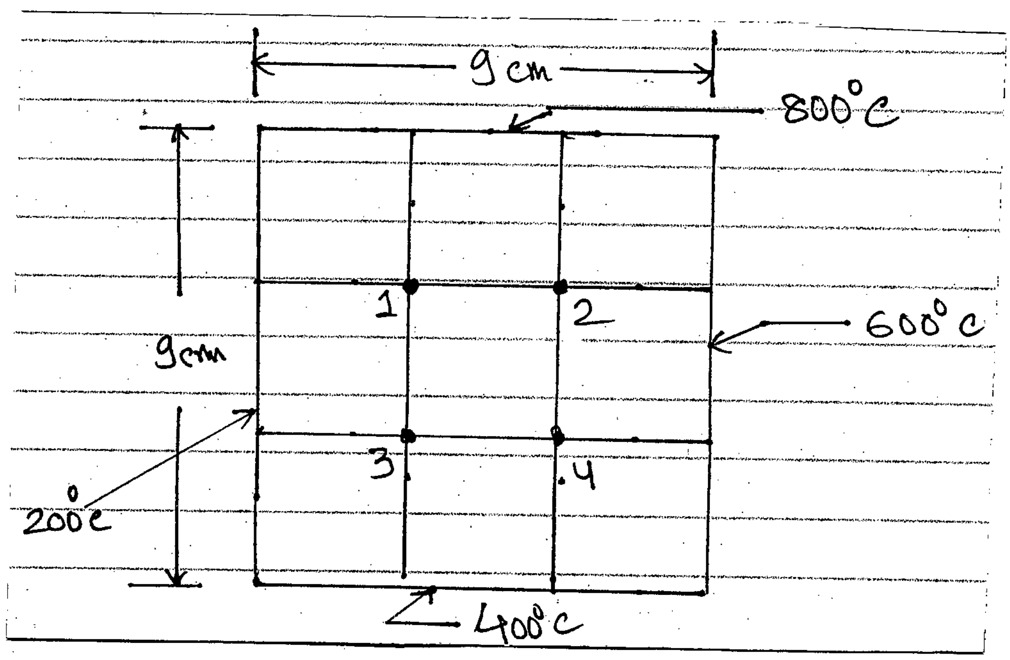
USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

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

The symbols have their usual meaning. Assume any missing data with reasonable accuracy.

1. A rectangular plate g cm × g cm of unit depth to be considered. Edges are maintained at temperature as shown in figure. For a uniform network spacing $\delta x = \delta y = 3$ cm, answer the following:



(a) Write the finite difference equation for the four interior nodes as shown in the figure. **(10)**

(b) Write the Matrix form of the above equations. **(5)**

(c) Find the temperature at the nodes (Assume steady state). **(20)**

2. (a) The ground at a particular location is covered with snow pack at –5°C for a continuous period of three months, and the average soil properties at that location are $k = 0.45$ W/m.°C and $\alpha = 0.12 \times 10^{-6}$ m²/s. Assuming an initial uniform temperature of 20°C for the ground, determine the minimum burial depth to prevent the water pipes from freezing. **(15)**

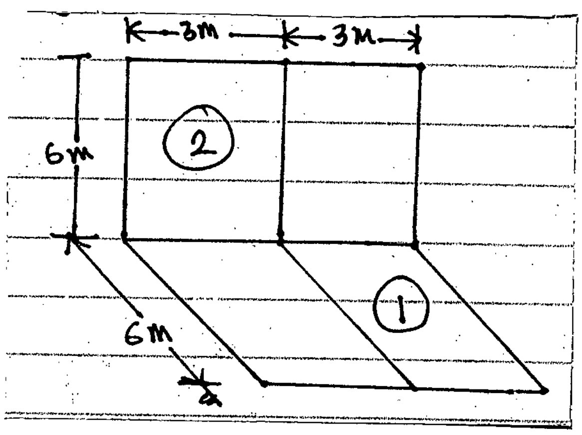
(b) In a production facility, large brass plates of 6 cm thickness that are initially at a uniform temperature of 30°C are heated by passing them through an oven that is maintained at 600°C. The plates remain in the oven for a period of 10 min. Taking the combined convection and radiation heat transfer coefficient to be h = 120 W/m² °C, determine the surface temperature of the plates when they come out of the oven. **(20)**

Contd P/2

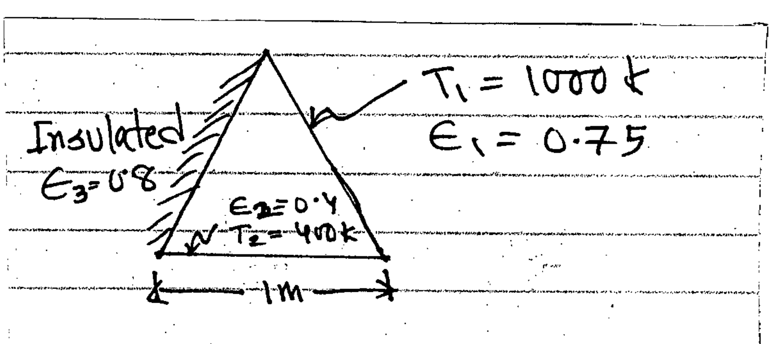
ME 301

3. (a) A black body is maintained at a temperature of 800°C. Find **(25)**
   (i) Wave length at which maximum monochromatic emissive power occurs.
   (ii) The Value of the maximum monochromatic emissive power occurs.
   (iii) The total emissive power.
   (iv) Fraction of the radiation emitted in the infrared radiation range.

   (b) Determine the shape factor F_{1-2}, for the rectangles shown. **(10)**



4. (a) An oven as shown in Figure, is a long equilateral triangular duct in which one heated surface is maintained at 1000 K, $\in = 0.75$ another surface is insulated $\in = 0.8$. The third surface is at 400 K, $\in = 0.4$. The triangle is of width W = 1 m, operation is steady state. **(25)**
   (i) Draw the equivalent thermal circuit and show all the resistances.
   (ii) Determine the heat to be supplied at heated surface so as to maintain temperature of the surface at 1000 K.
   (iii) Determine the temperature of the insulated surface.



   (b) Two parallel infinite planes $\in_1 = 0.45$ and $\in_2 = 0.3$. One plane is maintained at $T_1 = 100^oC$ and the other at $T_2 = 500^oC$. **(10)**
   (i) Find the radiation heat exchange between the planes.
   (ii) If a radiation shield of $\in_{Shield} = 0.04$ (each side) is placed between them then find the percentage reduction in heat exchange between the two planes.

Contd P/3

ME 301

SECTION – B

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

5. (a) Distinguish between thermodynamics and Heat Transfer. **(5)**

(b) Briefly explain the thermophysical properties of a solid under heat conduction. **(10)**

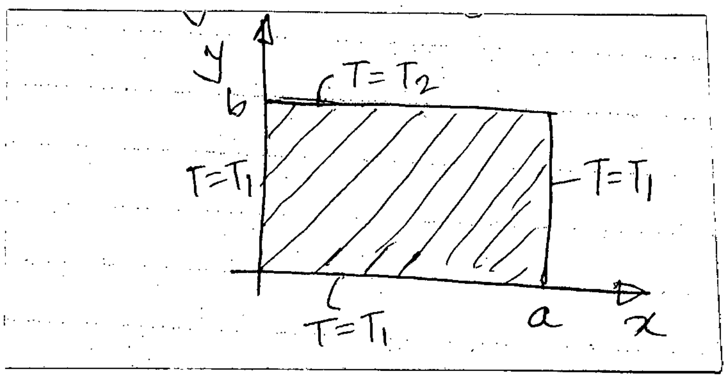
(c) Consider the base plate of a 1200-W household iron that has a thickness of 0.5 cm, base area of 300 cm^2 and thermal conductivity of 15 W/m°C. The inner surface of the base plate is subjected to uniform heat flux generated by the resistance heaters inside and the outer surface loses heat to the surroundings at 20°C by convection. Taking the convective heat transfer coefficient to be 80 W/m^2 °C and disregarding heat loss by radiation, obtain an expression for the variation of temperature in the base plate, and evaluate the temperatures at the inner and outer surfaces. **(20)**

6. (a) Name and illustrate various kinds of boundary conditions commonly considered in heat conduction problems. **(10)**

(b) What is meant by R-value of insulation? **(5)**

(c) A long homogeneous resistance wire of radius 0.5 cm and thermal conductivity 13.5 W/m °C is being used to boil water at atmospheric pressure by the passage of electric current. Heat is generated in the wire uniformly as a result of resistance heating at a rate of 4.3×10^7 W/m^3. If the outer surface temperature of the wire is measured to be 108°C, obtain a relation for the temperature distribution and determine the temperature at the centerline of the wire when steady operation conditions are reached. **(20)**

7. Obtain an expression of steady-state temperature $T(x,y)$ in a rectangular plate $0 \le y \le b$, $0 \le x \le a$ for the following boundary conditions. **(35)**



8. (a) Briefly explain the performance parameters of a fin. Also provide useful tips for better fin design. **(12)**

(b) Comment on the insulation thickness of steam pipe and electric wire in consideration with heat transfer. **(8)**

(c) A 4-cm-diameter and 10-cm-long aluminium fin (K = 237 W/m °C) is attached to a surface. If the heat transfer coefficient is 12 W/m^2 °C, determine the percent error in the rate of heat transfer from the fin when infinitely long fin assumption is used instead of the adiabatic fin tip assumption. **(15)**

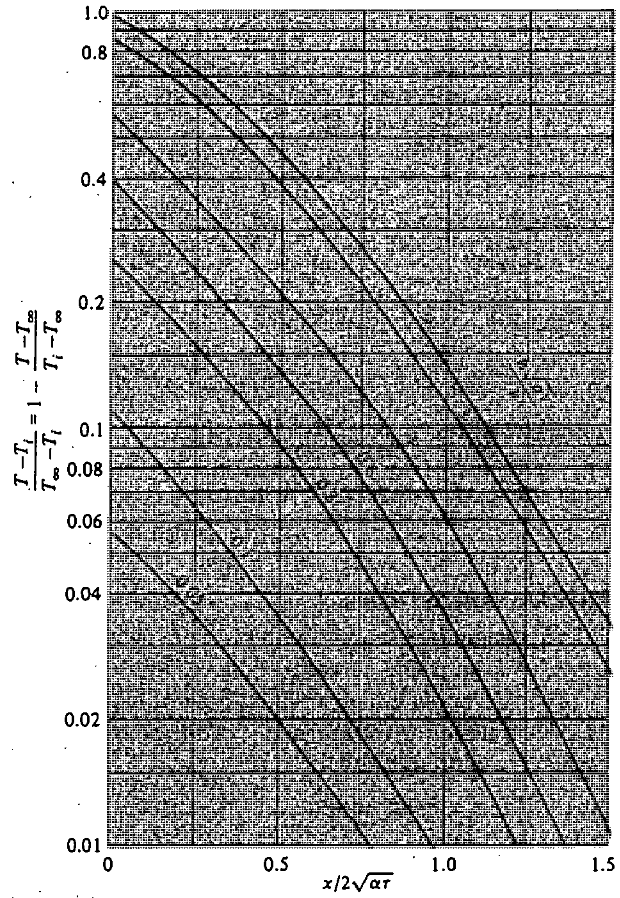
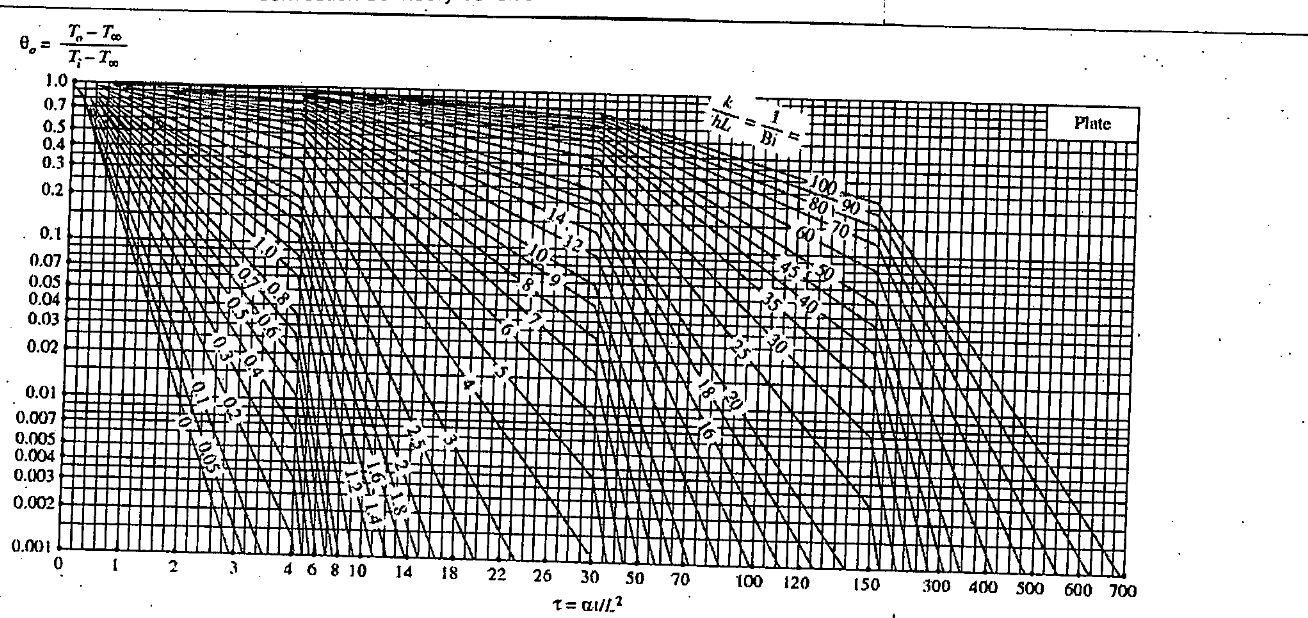
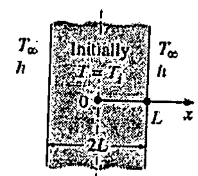
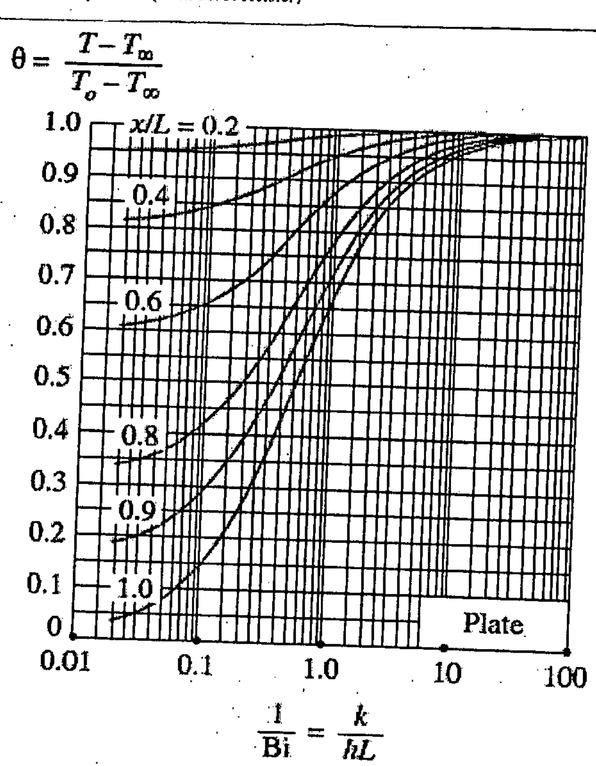


Fig. Temperature distribution in the semi-infinite solid with convection boundary condition.



(a) Midplane temperature (from M. P. Heisler)





(b) Temperature distribution (from M. P. Heisler)

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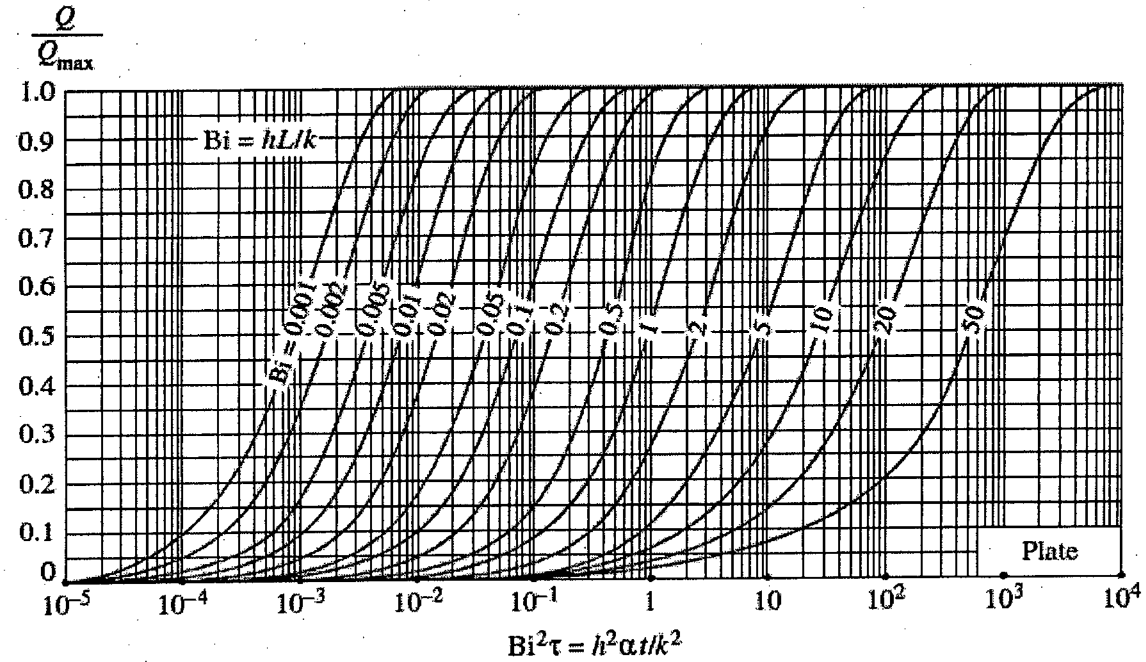

(c) Heat transfer (from H. Gröber et al.)

Table Radiation Functions.

λT μm K	$E_{b\lambda}/T^5$ $\frac{W}{m^2\,K^5\,\mu m}$ $\times 10^{11}$	$\frac{E_{b0-\lambda T}}{\sigma T^4}$
555.6	0.400×10^{-5}	0.170×10^{-7}
666.7	0.120×10^{-3}	0.756×10^{-6}
777.8	0.00122	0.106×10^{-4}
888.9	0.00630	0.738×10^{-4}
1 000.0	0.02111	0.321×10^{-3}
1 111.1	0.05254	0.00101
1 222.2	0.10587	0.00252
1 333.3	0.18275	0.00531
1 444.4	0.28091	0.00983
1 555.6	0.39505	0.01643
1 666.7	0.51841	0.02537
1 777.8	0.64404	0.03677
1 888.9	0.76578	0.05059
2 000.0	0.87878	0.06672
2 111.1	0.97963	0.08496
2 222.2	1.0663	0.10503
2 333.3	1.1378	0.12665
2 444.4	1.1942	0.14953
2 555.6	1.2361	0.17337
2 666.7	1.2645	0.19789
2 777.8	1.2808	0.22285
2 888.9	1.2864	0.24803
3 000.0	1.2827	0.27322
3 111.1	1.2713	0.29825
3 222.2	1.2532	0.32300
3 333.3	1.2299	0.34734
3 444.4	1.2023	0.37118
3 555.6	1.1714	0.39445
3 666.7	1.1380	0.41708
3 777.8	1.1029	0.43905
3 888.9	1.0665	0.46031
4 000.0	1.0295	0.48085
4 111.1	0.99221	0.50066
4 222.2	0.95499	0.51974
4 333.3	0.91813	0.53809
4 444.4	0.88184	0.55573
4 555.6	0.84629	0.57267
4 666.7	0.81163	0.58891
4 777.8	0.77796	0.60449
4 888.9	0.74534	0.61941
5 000.0	0.71383	0.63371
5 111.1	0.68346	0.64740
5 222.2	0.65423	0.66051
5 333.3	0.62617	0.67305
5 444.4	0.59925	0.68506
5 555.6	0.57346	0.69655

Table Radiation Functions (*Continued*).

λT μm K	$E_{b\lambda}/T^5$ $\frac{W}{m^2\,K^5\,\mu m}$ $\times 10^{11}$	$\frac{E_{b0-\lambda T}}{\sigma T^4}$
5 666.7	0.54877	0.70754
5 777.8	0.52517	0.71806
5 888.9	0.50261	0.72813
6 000.0	0.48107	0.73777
6 111.1	0.46051	0.74700
6 222.2	0.44089	0.75583
6 333.3	0.42218	0.76429
6 444.4	0.40434	0.77238
6 555.6	0.38732	0.78014
6 666.7	0.37111	0.78757
6 777.8	0.35565	0.79469
6 888.9	0.34091	0.80152
7 000.0	0.32687	0.80806
7 111.1	0.31348	0.81433
7 222.2	0.30071	0.82035
7 333.3	0.28855	0.82612
7 444.4	0.27695	0.83166
7 555.6	0.26589	0.83698
7 666.7	0.25534	0.84209
7 777.8	0.24527	0.84699
7 888.9	0.23567	0.85171
8 000.0	0.22651	0.85624
8 111.1	0.21777	0.86059
8 222.2	0.20942	0.86477
8 333.3	0.20145	0.86880
8 888.9	0.16662	0.88677
9 444.4	0.13877	0.90168
10 000.0	0.11635	0.91414
10 555.6	0.09817	0.92462
11 111.1	0.08334	0.93349
11 666.7	0.07116	0.94104
12 222.2	0.06109	0.94751
12 777.8	0.05272	0.95307
13 333.3	0.04572	0.95788
13 888.9	0.03982	0.96207
14 444.4	0.03484	0.96572
15 000.0	0.03061	0.96892
15 555.6	0.02699	0.97174
16 111.1	0.02389	0.97423
16 666.7	0.02122	0.97644
22 222.2	0.00758	0.98915
27 777.8	0.00333	0.99414
33 333.3	0.00168	0.99649
38 888.9	0.940×10^{-3}	0.99773
44 444.4	0.564×10^{-3}	0.99845
50 000.0	0.359×10^{-3}	0.99889
55 555.6	0.239×10^{-3}	0.99918

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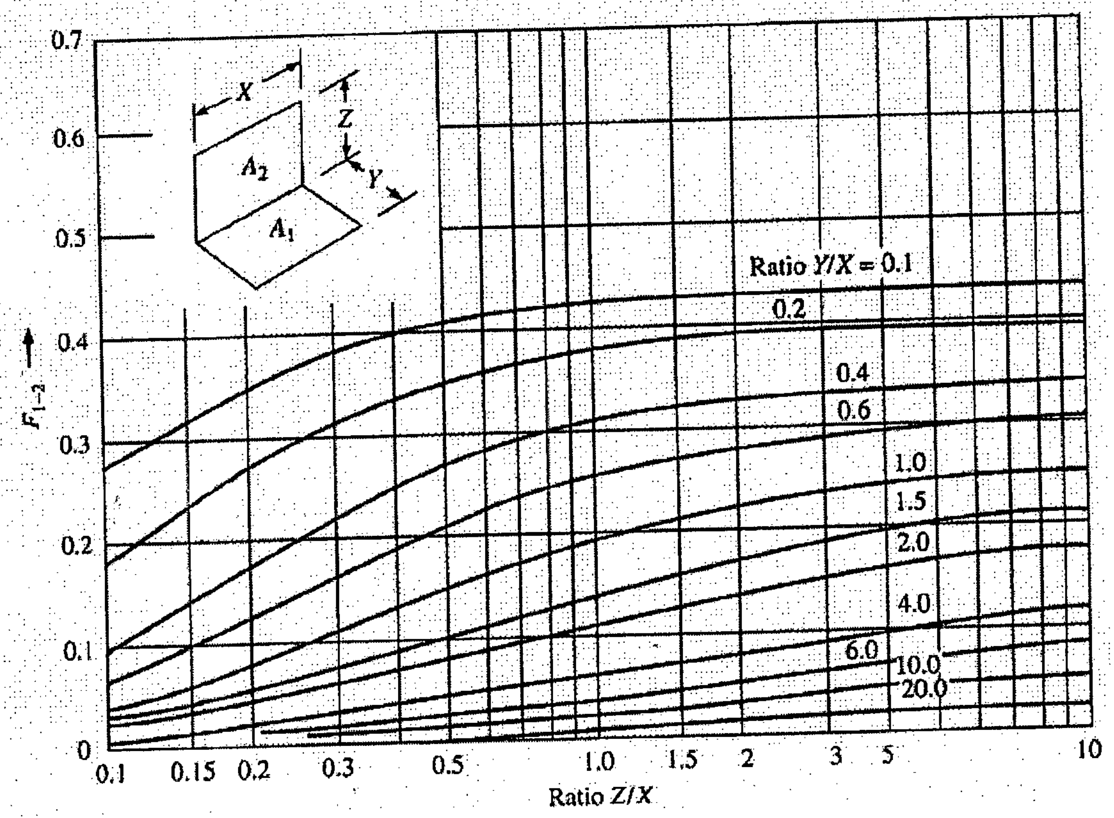
Figure Radiation shape factor for radiation between perpendicular rectangles with a common edge.



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