Fayoum University
Faculty of Engineering
Preparatory Year

Engineering Statics
Final Exam 2016/2017
Time: 3 hours

ملاحظات هامة:

١- أجب عن الأسئلة بالترتيب مع وضع النتائج الهامة والنتيجة النهائية داخل برواز واضح.

٢- توزيع الدرجات: السؤال الأول (١٢) والثاني (٨) والثالث (٨) والرابع (١٦) والخامس (١٦).

Answer the following questions:

[1] For the system in Fig. (1), $F_1=F_2 = 10.0$ N, $F_3=20.0$ N and $F_4=20\sqrt{2}$ N. A free couple of magnitude $G_1=30.0$ N.m acts on the face ABDH in the direction shown.

(a) find of the resultant.

(b) find the vector expression of the couple G_1.

(c) find the moment of the force F_1 about the z-axis.

(d) find the couple formed by the two forces $F_1$and F_2.

[2] If the resultant couple of the system in Fig. (2) equals zero, find the value of F_2.

[3] Determine the tension in the cable AB for the system shown in Fig. (3). Assume all surfaces are smooth.

[4] For the system shown in Fig. (4), the beam OD has a spherical hinge at O, neglect the weight of all members and wires, find:

(a) the tension in the wire HD.

(b) the force on the hinge at E.

(c) the tension in the wires CD and BD.

[5] The lamina shown in Fig. (5) has a density of 2.0 kg/m^2. A particle $m_o=4.0$ kg is located at point A as shown, Find:

(a) the coordinates $(\bar{x}, \bar{y})$ of the center of mass.

(b) the moment of inertia (I_{xx}).

(c) the moment of inertia (I_{yy}).

(d) the radius of gyration (i_o).

Best Wishes

Dr. Ahmed A. Al-Kaisy