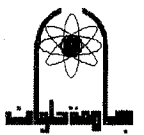
 كلية الهندسة بحلوان	Dept/Division :Power Academic level: First Semester: First 2015/16 Course code & title: Mathematics(2) Instructor: Ass. Pr. Hassan Mohamed ,Dr. Amany Saad Total mark: 100 marks Time allowed: 3 hrs	 جامعة أسيوط
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✓ Answer the following questions :-

**Q1 a)** Find the volume of the solid S bounded the sphere  $x^2 + y^2 + z^2 = 1$  and the cone  $z = \sqrt{x^2 + y^2}$ .

**b)** Find the total differentiation for the function  $z = e^{x^2 - y^2}$ .

(15 Marks)

**Q2 a)** Expand the function  $\tan^{-1}(x + 2y)$  near the point (1,1) by Taylor's Theorem.

**b) Evaluate** 
$$\int_{-3}^3 \int_{-\sqrt{9-x^2}}^{\sqrt{9-x^2}} \int_0^{9-x^2-y^2} x^2 dz dy dx .$$

(15 Marks)

**Q3 a)** Find the stationary points of the function  $f(x, y) = 2x^2y^2 + 4xy^2 - 4y^3 + 16y + 5$  and examine their nature.

**b)** Evaluate the area of the region R bounded by  $x = y^2, x = 2y - y^2$ .

(15 Marks)

**Q4 Solve:**

**a)**  $y e^{\frac{x}{y}} dx - (x e^{\frac{x}{y}} - y^2) dy = 0 .$

**b)**  $\frac{dy}{dx} + \sin(x + y) + 1 = 0 .$

**c)**  $(x + \tan^{-1} y) dx + \frac{x + y}{1 + y^2} dy = 0 .$

(15 Marks)

**Q5 Evaluate:**

a)  $\ell\{e^{5t} \sin 2t \cos 3t\}$ .

b)  $\ell\{t \sin^2 5t\}$ .

c)  $\ell^{-1}\left\{\frac{s+1}{s^2-2s+7}\right\}$ .

d)  $\ell^{-1}\left\{\frac{s+5}{s^2+s-2}\right\}$ .

**(16 Marks)**

**Q6 Solve by using Laplace transform:**

$$y'' - y' - 2y = e^{-t} \quad y(0) = 1, y'(0) = 0.$$

**(14 Marks)**

**Q7 In electric circuits  $L \frac{di}{dt} + Ri = E(t)$  if a coil with resistance 15 Ohms and an inductance of 10 Henries are connected to 90 Volts supply determine the value of current after 2 seconds.**

**(10 Marks)**

*With Best Wishes*

*Ass. Pr. Hassan Mohamed  
Dr. Amany Saad*



كلية الهندسة  
بحلوان

**Dept/Division : Electrical Power & Machines Engineering**

Academic level: First

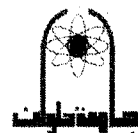
Semester: Fall 2015/2016

Course code & title: POW 3111 Electromagnetic

Instructor: Dr. Danial Ashem, Dr. M. Ramadan Ahmed & Dr. Abdelghafar M. Elcashlan

Total mark: 100 marks

Time allowed: 3 hrs



**Instructions: Answer the following 6 questions given in 2 pages**

المادة / الكهرومغناطيسية للفترة الأولى قوى للكهرباء / دانيال  
يوم الأحد الموافق ١٠/١١/٢٠١٦

Q1. a. A charged line parallel to z-axis with  $\rho_L = 20 \text{ nC/m}$  and passes through  $x = 2 \text{ m}$ ,  $y = -4 \text{ m}$ . Determine  $\vec{E}$  at  $(-2, -1, 4) \text{ m}$ . (10 marks)

b. Given  $\vec{D} = (10x^3/3) \hat{a}_x \text{ C/m}^2$ . Evaluate: i.)  $\oint \vec{D} \cdot d\vec{s}$  and ii.)  $\int_{vol} \vec{v} \cdot \vec{D} dv$ ,

where the volume is for a cube with an edge of 2 m, centered at the origin and the edges parallel to the axes. (10 marks)

Q2. Given the potential  $V = 100(x^3 + y^3)$  of an equipotential surface and a point  $P(4, 2, 2)$  lying on the surface. Find  $V$ ,  $\vec{E}$ ,  $\vec{D}$ ,  $\rho_s$  and also the equation of the conductor surface.

Determine the equation of the stream line passing through P. (15 marks)

$$\epsilon_0 = 8.854 \times 10^{-12} \text{ F/m}$$

**Q.3**

**[18 Marks]**

A coaxial transmission line extended along the z-direction has an inner surface radius  $a = 5 \text{ mm}$ , outer surface (with zero thickness) radius  $b = 20 \text{ mm}$ , and a direct current of 12 A passing in the  $a_z$  direction in the center conductor of the radius ( $a$ ) while the outer surface is a current sheet of  $k = -5 \hat{a}_z \text{ A/m}$ . If the volume between the inner and outer surfaces contains a magnetic material having  $\mu_r = 250$ , find the following:

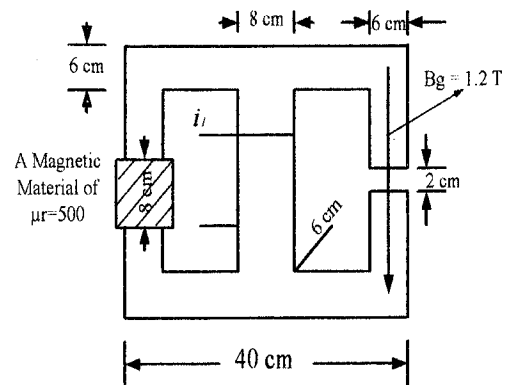
- The magnitude and direction of the magnetic field intensity  $H$  and the magnetic flux density  $B$  at  $\rho = 0.5, 2.5, 4.5, 5.5, 7.5, 19, 21$  and  $25 \text{ mm}$ . (8 Marks)
- Draw the variations of both  $H$  and  $B$  as function of  $\rho$ . (2 Marks)
- The magnitude and direction of the magnetic force (per unit length) acting on the outer surface. (3 Marks)
- The magnetic flux in the volume between the inner and outer surfaces. (3 Marks)
- The inductance  $L$  (per unit length) for this line. (2 Marks)

## Q.4

(17 Marks)

A square magnetic circuit shown in the Figure is made from a cast steel material having a relative permeability  $\mu_r = 2500$ , square cross-section area of  $36 \text{ cm}^2$ , and neglecting leakage and fringing fluxes, find the following:

- The current ( $i_1$ ) of the exciting coil required to produce a magnetic flux density of  $1.2 \text{ T}$  in the air-gap of  $2 \text{ cm}$ . (8 Marks)
- The inductances of the coil  $L_1$  if the number of turns is 100 and the dimension of the magnetic material is  $8 \times 8 \times 6 \text{ cm}$  having  $\mu_r = 500$  (4Marks)
- The magnetic flux density passing through the left leg and the Ampere Turns (AT) absorbed by the magnetic material. (5Marks)



## Q.5



(18 marks)

The surface  $z = 0$  separates two perfect dielectrics. In region 1,  $z > 0$ ,  $\epsilon_{r1} = 3$ ; in region 2,  $z < 0$ ,  $\epsilon_{r2} = 5$ . It is known that  $\mathbf{E}_1 = 10 \mathbf{a}_x + 20 \mathbf{a}_y + 30 \mathbf{a}_z \text{ V/m}$ , find: the energy density in region 1 ( $W_{e1}$ ),  $\mathbf{D}_1$ ,  $\mathbf{E}_2$ ,  $\mathbf{P}_2$ , the angle  $\theta_2$  that  $\mathbf{D}_2$  makes with  $\mathbf{a}_z$ .

## Q.6

(17 marks)

A certain material has  $\sigma = 0$ ,  $\epsilon_r = 1$ , if  $\mathbf{H} = 4 \sin(10^6 t - 0.01z) \mathbf{a}_y \text{ A/m}$ , use Maxwell's equations to obtain expressions for  $\mathbf{D}$ ,  $\mathbf{E}$ ,  $\mathbf{B}$ , and  $\mu_r$ .

 كلية الهندسة بحلوان	<b>Department: Electrical Power &amp; Machines Engineering</b> <b>Academic level: First Semester: First Term 2015/2016 Exam: January 2016</b> <b>Course code: GEN 3113 Course Title: Project Management</b> <b>Instructor: Prof. Alaa Abdel Razek &amp; Dr Abdel-Latef Sayed</b> <b>Total Mark: 40 Marks Time allowed: 2 hrs.</b>	 جامعة Assiut
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**Instructions: Answer All the following questions (four questions):**

**Question No. 1: Choose the correct answer [15 Marks] (1mark for each one) write the answer in table**

**1- All of the following are characteristics of a project EXCEPT:**

- a- Temporary. b-Definite beginning and end. c-Interrelated (متراپطة) activities. d-Repeats itself every month.

**2- Which project management process group normally takes the MOST project time and resources?**

- a- Initiating b- Planning c- Executing d- Design

**3- During what part of the project management process is the project scope statement created?**

- a- Initiating b- Planning c- Executing d- Monitoring and control

**4- The document that describes how the project will be executed, monitored, and controlled.**

- a- Control Scope b- project Management Plan c- Project Charter d- Collect Requirements

**5- You are managing a six-month project. After five months of work, the project is on schedule and budget, but the stakeholders are not satisfied with the deliverables. This situation will delay the project completion by one month. The MOST important process that could have prevented this situation is:**

- a- Define Scope b- Control Schedule, c- Monitoring and Control Risks d- Control Scope.

**6- Infrastructure around the project is one of:**

- a- Collect Requirements c- Project Scope Statement  
b- Project Charter d- Enterprise environmental factors.

**7- Rearranging resources so that a constant number of resources is used each month is called:**

- a- Fast track the project. b- Level the resources. c- Crash the project. d- Decomposition

**8- A technique used to shorten the schedule duration for the least incremental cost by adding resources.**

- a- Fast track the project. b- Level the resources. c- Crash the project. d- Decomposition

**9- If the optimistic estimate for an activity is 6 days, the pessimistic estimate is 15 days, and the most likely is 9 days what is expected duration of this activity? a- 9.5 b- 10 c- 6 d- 12**

**10- Progressive planning where near term work is broken down in detail and distant work is kept at a higher WBS level. a- Decomposition b- Resource calendar c- Roll wave planning d- Activity list**

**11- A cost baseline is an output of which cost management process?**

- a- Estimate Activity Resources b- Estimate Costs c- Determine Budget d- Control Costs

**12- The project manager is allocating overall cost estimates to individual activities to establish a baseline for measuring project performance. What process is this?**

- a- cost Management b- Estimate Costs c- Determine Budget d- Control Costs

**13- Involve estimating individual work items or activities and summing them to get a project total**

- a- Analogous estimates b- Bottom-up estimates c- Parametric modeling d- earned value

**14- All of the following are examples of the cost of nonconformance EXCEPT:**

- a- Rework. b- Quality training. c- Scrap (خردة). d- Warranty costs.

**15- As the project manager, you have nine stakeholders with whom you need to communicate. One of stakeholders has been left. How many communications channels do you have now?**

- a- 7 b- 16 c- 28 d- no one of them

**Question No. 2: [10Marks]**

a. For the project which its activity dependency as shown in the following table Draw a network diagram, and answer the questions below. (7 marks)

<u>ACTIVITY</u>	<u>PRECEDING</u>	<u>DURATION</u> <u>"DAY"</u>
START		0
D	START	4
A	START	6
F	D, A	7
E	D	8
G	F, E	5
B	F	5
H	G	7
C	H	8
END	C, B	0

- I. What is the critical path and its duration of?
- II. What is the duration of the PROJECT?
- III. What is the float of activity E?
- IV. What is the float of activity D?
- V. To shorten the length of the project, the sponsor has offered to remove the work of activity E from the project, making activity D the predecessor to activities G and F. What will be the effect?

b. For the project which its activity dependency as shown in the following table insert its activities in project Microsoft sheet and estimate the total duration (starting date 3/1/216). (3 marks)

Item	Duration	Predecessors
A	3	--
B	4	Start with A start by 3 days delayed
C	4	A
D	3	Finished while C start
E	4	Finished while B finished

**Question No. 3: [5 Marks]**

You have a project to build an electrical power station. The station has six stages. Each stage is to take one years to finish and is budgeted for \$1000000 per stage. The stages are planned to be completed one after the other. Today is the end of year three. Using the following project status chart, calculate PV, EV, AC, CV, CPI, SV, SPI, and draw the relation between PV, EV, AC. Comment on your graph.

Task	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Progress	100%	90%	80%	30%	10%	0%
Cost spent	1300000	950000	800000	350000	120000	0

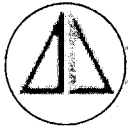
PV Planned value, CV Cost variance, SV schedule variance, CPI Cost Performance Index and SPI Schedule Performance Index

**Question No. 4: [10 Marks]**

- a- List the Modern Organizational Chart of Power System Planning Functions.
- b- Write down activities of the electrical power system planning.
- c- For the electric power transformer - oil type and electric power diesel-generator set:
  - I. List installation requirements.
  - II. Construct work break structures (WBS)

**End of Exam**

مع تمنياتي بالتوفيق الى ابنائى الطلاب.



كلية الهندسة بطنان

Dept.: Electrical Power and Machines Engineering

Academic level: Three

Semester: First 2015/2016

Course Code & Title: GEN 3112 & Engineering Materials

Instructor: Dr. Zakaria M.M.M. Dr. Mohammed Abdel Wahed

Total mark: 100 marks

Time allowed: 3 Hours



**Assume Any Missing Data**

Answer the following questions:

**Problem (1) (30Points)**

A rigid bar ABC is hinged at A and attached to brass bar BF (length of 0.35m and area 400mm<sup>2</sup>) and steel bar CD (length 0.3m and area 250mm<sup>2</sup>). The temperature of brass bar BF is **lowered** by 30°C and that of steel bar CD is **Raised** by 30°C. Neglecting any possibility of lateral buckling. Find the normal stresses in the brass and steel bars.

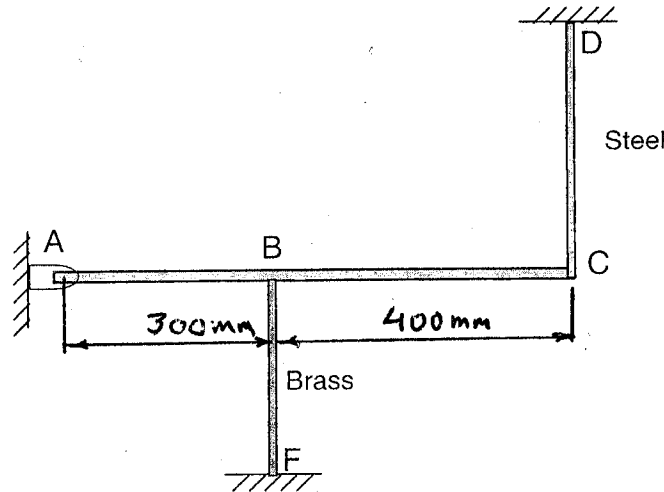
Take for steel  $E = 2 \times 10^5 \text{ N/mm}^2$ ,  $\alpha = 12 \times 10^{-6} / ^\circ\text{C}$ , area  $A = 250 \text{ mm}^2$ ,  
for brass  $E = 0.9 \times 10^5 \text{ N/mm}^2$ ,  $\alpha = 20 \times 10^{-6} / ^\circ\text{C}$ , area  $A = 400 \text{ mm}^2$ ,

الأمر 1/1/17

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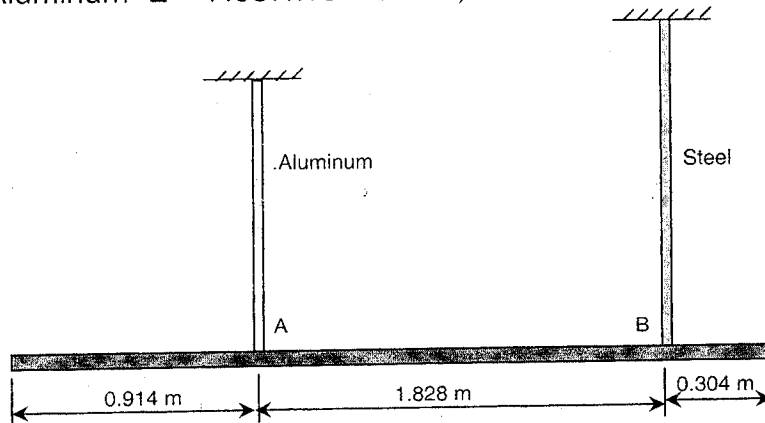


**Problem (2) (20Points)**

Uniform concrete slab of total weight  $W$  is to be attached as shown in Fig. (2) to two rods whose lower ends are on the same level. Determine the ratio of the areas of the rods so that the slab will remain level.

Take for steel  $E = 204.07 \times 10^3 \text{ N/mm}^2$ ,  $L = 1.828 \text{ m}$ .

for Aluminum  $E = 7.037 \times 10^4 \text{ N/mm}^2$ ,  $L = 1.219 \text{ m}$ .



مع تمنياتي بالتوفيق والنجاح  
دكتور/ محمد عبد الواحد

من فضلك اقلب الصفحة

**JANUARY 2016**  
**NOTES**  
**ASSUME ANY MISSING DATA.**

**PROBLEM NO.3**

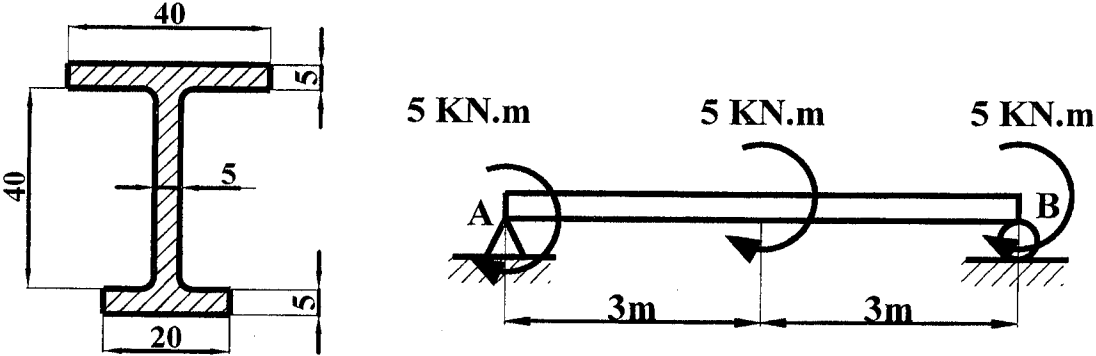
(25 Degree)

A. Write the Relations between the Shear Stress, Shear Force, First Moment of Area, Moment of Inertia and Width of beam Layer.

(5 Degree)

B. b- 6-m span simply supported beam is loaded as shown in figure by using maximum bending moment calculate the value of maximum bending stress and draw the bending stress distribution on the cross section. If the cross section of beam at dimension in mm as shown in figure.

(20 Degree)



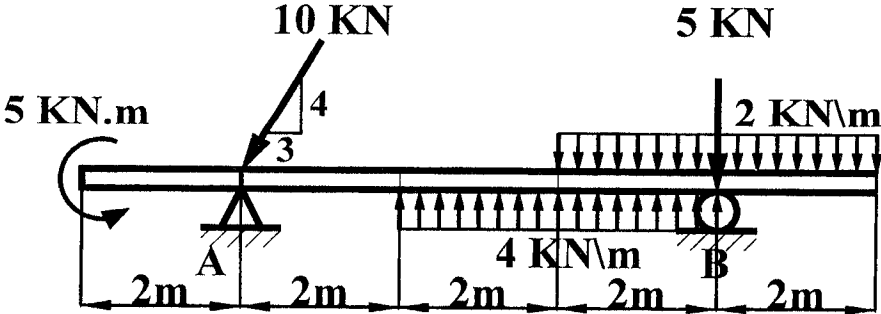
Beam cross-section

**PROBLEM NO.4**

(25 Degree)

A beam 10-m long is supported at A and B loaded as shown in Figure.

- a- Draw the Normal Force diagram.
- b- Draw the Shear Force diagram.
- c- Draw the Bending Moment diagram.
- d- Find the positions and magnitude of maximum shear force and bending moment.
- e- Find the position of the point of contra flexure.



GOOD LUCK AND BEST WISHES

DR. ZAKARIA M. M. M.