جمهورية العراق

وزارة التعليم العالي و البحث العلمي

جامعة الفرات الأوسط التقنية

الكلية التقنية الهندسية / النجف

قسم هندسة تقنيات السيارات

المرحلة الرابعة

أسئلة الفصل الأول للعام الدراسي

٢٠١٦-٢٠١٧

شعبة ضمان الجودة و الأداء الجامعي

قسم السيارات
٤/س

وزارة التعليم العالي والبحث العلمي
جامعة الفرات الأوسط التقنية
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قسم هندسة السيارات

المادة: نظرية المركبات
المرحلة : الرابعة
الزمن: ساعتان
التأريخ: ١٨ /١/ ٢٠١٧

امتحان الفصل الاول للعام الدراسي ٢٠١٦/٢٠١٧

Q1\ Complete the following: ***(20 Marks)***

1-The most important component of a rubber compound is.....

2-The smaller the particle of carbon black, ... the resistance of the polymer to treat wear during moderate service.

3-When the tractive effort TE is equal to tractive resistance TR, a vehicle will be either ..... or ..... at a uniform velocity.

4-The shoulder of the tire can be defined as.....

5-The curve is banked an angle with the horizontal. So, there is no tendency to skid up or slip down the road, this angle is known as .....

Q2 A vehicle of mass 1220 Kg has a load distribution giving 40% of the total mass on the front wheels on a 2.74 m wheelbase. With front wheel drive the maximum acceleration is 2.314 m/s^2 when the coefficient of adhesion is 0.8. Determine the height of the center of gravity above the road surface, and the maximum possible acceleration if rear wheel drive was adopted. **(25 Marks)**

Q3 A\ Sketch the performance curves for undergeared and overgeared vehicles. **(15 Marks)**

Q4 Drive the equation of banking of curved highways if a car is on the point of skidding up due to highest speed.

$$\tan(\theta + \emptyset) = \frac{v^2}{gr}$$ **(15 Marks)**

Q5 A wheel of 0.5m radius carries a vertical loading of 4800N. A torque of 1000N.m is applied to the wheel. Determine the flattened distance if the loss percentage of 65% effective propelling force. **(25 Marks)**

Good Luck

Examiner
A. Lec. Hussein Al-Abidi

Head of Dep.
Dr. Hyder H. Abid

قسم السيارات
٤/ س

Ministry of Higher Education and Scientific Research
Foundation of Technical Education
Al-Furat Al-Awsat Technical University
Technical Engineering College / Najaf

Departments: Automotive Technical Engineering
Stage: fourth
Subject: Advanced automotive diagnosis
Exam Time: Two Hours

The First Semester Exam Questions for the Academic Year 2016-2017
First Semester

Note: Answer four questions only. All questions have same marks

Q1/

A. Explain the difference between a type A and type B OBD-II diagnostic trouble code.
B. List the eight-step funnel diagnostic procedure.
C. List the three methods that can be used to reprogram a PCM.
D. Why is a communication network used?

Q2/

A. What are four visual checks that should be performed on an engine if a mechanical malfunction is suspected?
B. What test procedure can be used to determine if the exhaust system is restricted (clogged)?
C. A typical immobilizer system consists of what parts?
D. A. What is the difference between an oscilloscope and a graphing multimeter

Q3/

A. What are the Nine modes of global (generic) OBD II?
B. What faults will an immobilizer system cause
C. How is the security information transferred from the key to the vehicle?
D. What is the difference between a trip and a warm-up cycle?

Q4/SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

1. What engine faults can be determined using a compression test?
2. How is a cylinder leakage test performed
3. Why must an ohmmeter be connected to a disconnected circuit or component?
4. What is the difference between DC coupling and AC coupling?
5. Why are the two wires twisted if used for network communications?
6. What could cause the MIL to flash?

Q5/ Choose the one alternative that best completes the statement or answers the question.

1) Technician A says that non-emission related codes that make the MIL illuminate are called "Type A" codes.
Technician B says that emission related codes that illuminate the MIL after the first fault are called "Type A" codes. Which technician is correct? 1) _____

A) Technician A only
B) Technician B only
C) Both technicians
D) Neither technician

2) Type _____ DTCs are set by non-emission related diagnostic tests. 2) _____

A) C and D
B) A and C
C) A or B
D) B and C

3) A P0300 DTC means _____. 3) _____

A) That one cylinder has low compression
B) A fault with the ignition system has been detected
C) A fault with a fuel injector has been detected
D) A random misfire has been detected

4) Technician A says that during a power balance test, the cylinder that causes the biggest RPM drop is the weak cylinder. Technician B says that if one spark plug wire is grounded out and the engine speed does not drop, a weak or dead cylinder is indicated. Which technician is correct? 4) _____

A) Technician A only
B) Technician B only
C) Both technicians
D) Neither technician

5) A voltmeter should be connected to the circuit being tested _____. 5) _____

A) Only when no power is flowing
B) In series
C) In parallel
D) Both A and C

6) The ability to measure AC current is useful when diagnosing _____. 6) _____

A) Resistance in a battery cable
B) Alternator function
C) Starter motor operation
D) None of these

7) Technician A says that an analog scope can store the waveform for viewing later. Technician B says that the trigger level has to be set on most scopes to be able to view a changing waveform. Which technician is correct? 7) _____

A) Technician A only
B) Technician B only
C) Both technicians
D) Neither technician

8) Two technicians are discussing the DC coupling setting on a DSO. Technician A says that the position allows both the DC and AC signals of the waveform to be displayed. Technician B says that this setting allows just the DC part of the waveform to be displayed. Which technician is correct? 8) _____

A) Technician A only
B) Technician B only
C) Both technicians
D) Neither technician

9) Technician A says that module communications networks are used to reduce the number of wires in a vehicle. Technician B says that a communications network is used to share data from sensors, which can be used by many different modules. Who is right? 9) _____

A) Technician A only
B) Technician B only
C) Both technicians
D) Neither technician

10) A customer states her MIL is blinking. Technician A says that this condition may damage the catalytic converter if the customer continues driving. Technician B says that freeze frame data should be stored. Which technician is correct? 10) _____

A) Technician A only
B) Technician B only
C) Both technicians
D) Neither technician

11) Technician A says that by looking at the mode $06 data, the technician can determine how close a component or system came to passing the onboard test. Technician B says that the data shown may have to be converted to obtain values that are meaningful to the technician. Which technician is correct? 11) _____

A) Technician A only
B) Technician B only
C) Both technicians
D) Neither technician

12) A General Motors vehicle is being checked using mode $06 for the proper operation of the oxygen sensor. The rich-to-lean sensor switch time is 0.030 seconds. Technician A says that this indicates a slow-reacting oxygen sensor. Technician B says that the oxygen sensor is reacting correctly and is okay. Which technician is correct? 12) _____

A) Technician A only
B) Technician B only
C) Both technicians
D) Neither technician

13) What is the purpose and function of an immobilizer system? 13) _____

A) Requires that the driver enter a password to start the vehicle
B) Prevents the vehicle from starting or running if the correct key is not used
C) To prevent entry inside the vehicle
D) Only allows the use of the ignition key that is properly matched to the lock cylinder

14) What can occur if the immobilizer system is not working as designed? 14) _____

A) No crank condition (the starter does not operate)
B) The engine starts but then almost immediately stalls
C) The engine cranks but does not start
D) Any of the above

15) Data are sent in packets, so it is normal to see activity and then _____ between messages. 15) _____

A) A flat line
B) 12 volts
C) An AC wave form
D) Zero volts

Good Luck

Assist Prof.
Dr. Dhafer Manea Hachim

Head of Department
Dr. Hiader H.

قسم السيارات
س ٤ / ٤

وزارة التعليم العالي والبحث العلمي
جامعة الفرات الاوسط التقنية
الكلية التقنية/نجف
قسم هندسة السيارات

أسئلة الفصل الاول للعام الدراسي (٢٠١٦-٢٠١٧)

المادة : اداره هندسية
المدرس : محمد علي ديوان
المرحلة : الرابعة
الوقت : ساعتان

ملاحظة :(الإجابة على اربعه أسئلة فقط)

س١/ ما المقصود ب ١- عناصر التكاليف الصناعية . ٢- مفهوم نقطة التعادل . ٣- حد الأمان . ٤- فترة الاسترداد. ٥- النظام الانتاجي . (25 deg.)

س٢/ أ / في احد مصانع إنتاج الأجزاء الكهربائية، تكون التكاليف الثابتة 8000 ID والتكاليف المتغيرة 4 ID للوحدة سعر البيع للوحدة هو 9 ID جد حجم التعادل على شكل إيرادات ثم على شكل وحدات ثم اوجد مقدار الربح عند حجم انتاج 3000 وحده . ومقدار الربح عند حجم انتاج 1000 وحدة . (15 deg.)

س٢ / ب/ ما المقصود بالتكاليف الثابتة والمتغيرة . اشرحها مع ذكر المخططات المتعلقة بها . (10 deg.)

س٣ / أ / ما هو النظام الانتاجي وماهي انواعه مع ذكر امثلة لكل نوع . (15 deg.)

س٣/ب/ حدد اي المشاريع افضل حسب البيانات التالية . (10 deg.)

المشروع	الدخل(ID)	الاستثمار(ID)
A	5000	1250
B	3500	850
C	4300	400
D	7000	660

س٤/ اذا كان عدد القطع المنتجة لشركة صناعيه عند 80% من الطاقة الإنتاجية هو 1000 قطعه بكلفه ثابته قدرها 2000 ID كلفه المواد الأولية 2 ID وكلفه القوى العاملة 6 ID للقطعة الواحدة . علما بان سعر البيع للقطعة الواحدة هو 12 ID جد .

١-الربح الكلي عند 80% من الطاقة الانتاجية ٢-الربح الكلي عند 100%من الطاقة الانتاجية . (25 deg.)

س٥ / أ / كيف يتم اختيار موقع المصنع وماهي الامور التي يجب مراعاتها عند اختيار الموقع . (15 deg.)

س٥ / ب / ماهي المؤثرات المستخدمة في الدراسة الاقتصادية للمشاريع الصناعية . (10 deg.)

(مع تمنياتنا بالموفقية والنجاح)

رئيس قسم هندسة تقنيات السيارات

مدرس المادة

قسم السيارات
م ع

ATU University
Technical College Engineering - Annajaf

Dep. : Automotive Eng. Techniques
Grade Level: 4th.
Object: Computer Application (CAD/CAM).
Exam Time: 2 hours.

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Note: Attempt All Questions

CAD Applications (MasterCAM X5) (50 Marks):

Q1: Determine the functions of the following:

(1) Analyze. (2) Color. (3) Screen. (30 Marks)

Q2: Draw the following structure in the figure (1) by applying the commands procedures. (20 Marks)

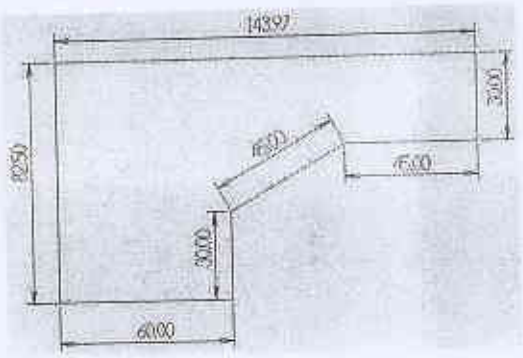

Figure (1) Frame tutorial

CAM Applications (50 Marks):

Q1: Mention the zeroth-points used in CNC-Turning machine. Explain one of statute. (10 Marks)

Q2: Write the block technology scenario with compression between T and M block. (10 Marks)

Q3: What are the functions of the following commands? (30 Marks)

(1) G90 (2) G91 (3) G20 (4) M08 (5) M98 (6) M03

GOOD LUCK

Examiner

A.Lecturer: Mohammed. A. Abass

Head of Dep.

Dr. Haider H. Al-Abdili

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قسم السيارات
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Technical Collage – Najaf
Automotive Eng. Department
First Semester Examination

Subject: Machine Design II
Class: 4th Year

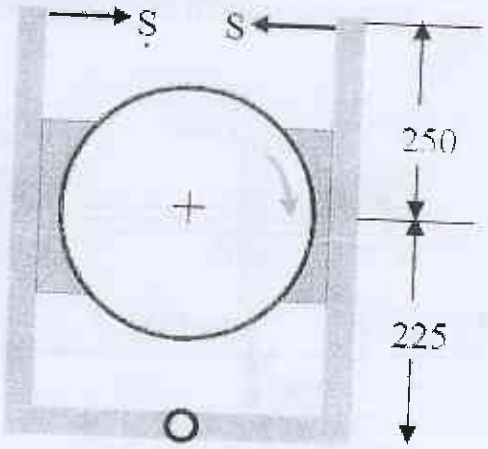
Time: 2 Hour
Date: 29 / 01 / 2017

Q.1| Solve For Two Branches Only. (40 MARKS)

A) Drive a formula to describe the total frictional torque acting on the friction surface (clutch) considering uniform axial wear theory.

B) Drive to determine the torque required to lower a load by means of square threaded screw and its efficiency.

C) A double shoe brake has diameter of brake drum 300 mm and contact angle of each shoe 90 degrees, as shown in figure. If the coefficient of friction for the brake lining and the drum is 0.4, find the spring force (S) necessary to transmit a torque of 30 Nm.



Q.2| The mean diameter of the square threaded screw having pitch of 10 mm is 50 mm. A load of 20 kN is lifted through a distance of 170 mm. Find the work done in lifting the load and the efficiency of the screw, when:

1. The load rotates with the screw.
2. The load rests on the loose head which does not rotate with the screw.

The external and internal diameter of the bearing surface of the loose head are 60 mm and 10 mm respectively. The coefficient of friction for the screw and the bearing surface may be taken as 0.08.

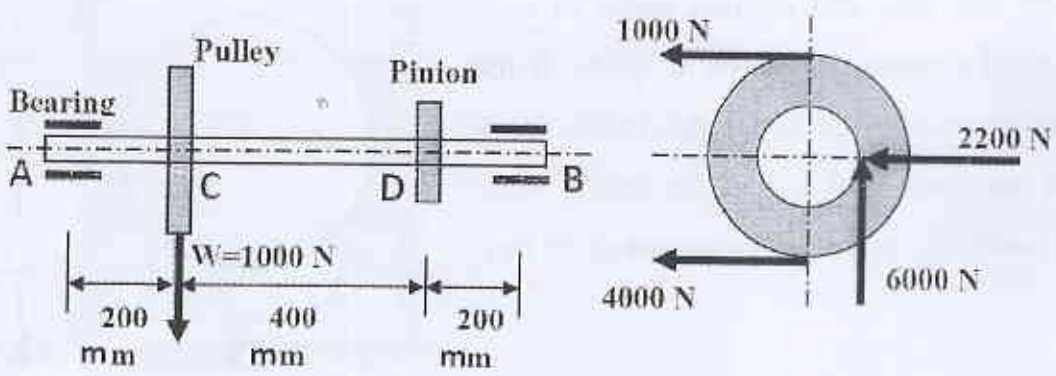
(30 MARKS)

Technical Collage – Najaf
Automotive Eng. Department
First Semester Examination

Subject: Machine Design II
Class: 4th Year

Time: 2 Hour
Date: 29 / 01 / 2017

Q.3| A pulley drive of 560 R.P.M rotational speed transmitting power to a pinion, which in turn is transmitting power to some other machine element. Pulley and pinion diameter are 400 mm and 200 mm respectively. A steel shaft; structural ASTM A36 steel of 250 MPa yield strength and 400 MPa ultimate strength; has to be designed for gradually applied load with 1.5 combined shock and fatigue factor for bending, 2 combined shock and fatigue factor for torsion, and 400 MPa allowable shear stress.



Design to determine the following:

1. The shaft diameter.
2. The transmitting mechanical power.
3. The safety factor of the structure.

(30 MARKS)

Mohammed N. N.
Jan. 08, 2017

Examiner
Mohammed N. Altemimi

Department Header
Dr. Haider Hassan