



ਆਈ.ਕੇ. ਗੁਜਰਾਲ ਪੰਜਾਬ ਟੈਕਨੀਕਲ ਯੂਨੀਵਰਸਿਟੀ (ਅਕਾਦਮਿਕ ਵਿਭਾਗ)



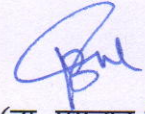
Ref. No.: IKG-PTU/DA/2086

Date : 24/10/2019

ਪ੍ਰਿੰਸੀਪਲ / ਡਾਇਰੈਕਟਰ / ਫੈਕਲਟੀ ਇੰਚਾਰਜ
ਐਡਮਿਨਿਸਟਰੇਟਿਵ ਕਾਲਜ / ਸੰਸਥਾਵਾਂ ਅਤੇ ਖੇਤਰੀ ਕੈਂਪਸ
ਆਈ.ਕੇ.ਗੁਜਰਾਲ ਪੰਜਾਬ ਟੈਕਨੀਕਲ ਯੂਨੀਵਰਸਿਟੀ।

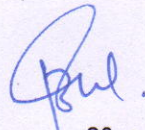
ਵਿਸ਼ਾ :- ਬੀ.ਟੈਕ (ਸਿਵਲ ਇੰਜੀ) ਬੈਚ 2018 ਤੀਜੇ ਸਮੈਸਟਰ ਦੇ ਨਮੂਨਾ ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਭੇਜਣ ਸਬੰਧੀ।

ਉਪਰੋਕਤ ਵਿਸ਼ੇ ਦੇ ਸਬੰਧ ਵਿੱਚ ਆਪ ਜੀ ਨੂੰ ਬੀ.ਟੈਕ. (ਸਿਵਲ ਇੰਜੀ) ਬੈਚ 2018 ਸਮੈਸਟਰ ਤੀਜਾ ਦੇ ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦਾ ਨਮੂਨਾ ਇਸ ਪੱਤਰ ਨਾਲ ਨੱਥੀ ਕਰਕੇ ਭੇਜਿਆ ਜਾਂਦਾ ਹੈ। ਆਪ ਜੀ ਨੂੰ ਲਿਖਿਆ ਜਾਂਦਾ ਹੈ ਕਿ ਇਹ ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦਾ ਨਮੂਨਾ ਸਬੰਧਤ ਵਿਦਿਆਰਥੀਆਂ ਅਤੇ ਅਧਿਆਪਕ ਸਾਹਿਬਾਨ ਨੂੰ ਪੁੱਜਦਾ ਕੀਤਾ ਜਾਵੇ ਤਾਂ ਜੋ ਵਿਦਿਆਰਥੀ ਇਮਤਿਹਾਨ ਦੀ ਸੁਚੱਜੇ ਢੰਗ ਨਾਲ ਤਿਆਰ ਕਰ ਸਕਣ। ਆਮ ਜਾਣਕਾਰੀ ਹਿੱਤ ਇਸ ਪੱਤਰ ਨੂੰ ਸੰਸਥਾ ਦੇ ਨੋਟਿਸ ਬੋਰਡ ਉਪਰ ਚਿਸਪਾਨ ਕਰਵਾਇਆ ਜਾਵੇ ਜੀ। ਇਸ ਸਬੰਧੀ ਕੋਈ ਵੀ ਸੁਝਾਅ ਨਿਮਨ ਹਸਤਾਖਰ ਦੇ ਦਫ਼ਤਰ ਨੂੰ ਭੇਜਿਆ ਜਾ ਸਕਦਾ ਹੈ। ਆਪ ਜੀ ਵੱਲੋਂ ਭੇਜੇ ਗਏ ਸੁਝਾਅ ਸਾਡੇ ਲਈ ਮਹੱਤਵਪੂਰਨ ਹਨ।


(ਡਾ. ਬਲਕਾਰ ਸਿੰਘ)
ਡੀਨ ਅਕਾਦਮਿਕ
24/10/19

ਇਸ ਦਾ ਇੱਕ ਉਤਾਰਾ :

1. ਇੰਚਾਰਜ ਸਕੱਤਰੇਤ : ਮਾਨਯੋਗ ਉਪ ਕੁਲਪਤੀ ਜੀ ਦੀ ਜਾਣਕਾਰੀ ਹਿੱਤ।
2. ਡਾਇਰੈਕਟਰ (ਮੇਨ ਕੈਂਪਸ) ਜੀ ਨੂੰ ਸੂਚਨਾ ਹਿੱਤ।
3. ਕੰਟਰੋਲਰ ਪ੍ਰੀਖਿਆਵਾਂ ਜੀ ਨੂੰ ਸੂਚਨਾ ਹਿੱਤ।
4. ਇੰਚਾਰਜ, ਆਈ.ਟੀ.ਐਸ. ਵਿਭਾਗ ਨੂੰ ਯੂਨੀਵਰਸਿਟੀ ਵੈਬਸਾਈਟ ਤੇ ਅਪਲੋਡ ਕਰਨ ਹਿੱਤ।


(ਡਾ. ਬਲਕਾਰ ਸਿੰਘ)
ਡੀਨ ਅਕਾਦਮਿਕ
24/10/19

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Total No. of Questions: 09

Total No. of Pages: 02

B. Tech. (CE) (Sem. 3)
Basic Electronics & applications
in Civil Engineering
Subject Code: BTEC-305-18
Paper ID:

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. Section A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. Section B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. Section C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Section – A

Q1

- (a) Why zener diode is used as a voltage regulator.
- (b) Discuss CE BJT in brief.
- (c) Convert $(689)_{10}$ into hexadecimal.
- (d) State the principle of oscillator.
- (e) Implement XOR Gate using NOR Gate.
- (f) Define Zener Breakdown.
- (g) Draw the circuit diagram and waveforms of bridge rectifier.
- (h) Define Diode.
- (i) Convert 1101011001 binary to decimal.
- (j) Define De Morgan Theorem.

SECTION – B

- Q2. Explain JK Flip –Flop with the help of circuit diagram.
- Q3. Explain the working of controlled transistor series and transistor shunt voltage regulator.
- Q4. Explain photodiode and its application.
- Q5. Discuss OPamp as adder, Subtractor, differentiator and integrator.

Q6. Discuss the operation of PNP transistor in CE and CB configuration.

SECTION – C

Q7. Write detail short note on following

(a) Universal Gates

(b) Virtual Ground

Q8. Discuss the working of central tap and bridge type fullwave rectifier by giving its advantages and disadvantages.

Q9. Implement the following logic expression with logic gates

$$Y = ABC + AB + BC$$

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Total No. of Questions: 09

Total No. of Pages: 02

B. Tech. (CE) (Sem. 3)

Civil Engineering – Introduction, Societal & Global Impact

Subject Code: HSMC-132-18

Paper ID:

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. Section A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. Section B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. Section C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Section - A

- a) Enlist any five ancient marvels in the field of civil engineering.
- b) Write down the importance of Civil Engineering in shaping the World.
- c) What are the methods to control flood?
- d) What is the difference between tunnel and bridge?
- e) What are the effect of infrastructure development and growth of the nation on GDP?
- f) What is hyper loop?
- g) List out the advantages of river interlinking.
- h) What is LEED rating system?
- i) What are the advantages of Tidal energy?
- j) What are the indicators of sustainability?

Section – B

Q2. Discuss in detail about the scope of work involved in various branches of civil engineering.

Q3. What is Global Warming? What are its causes and impact?

Q4 Discuss any five Engineering wonders of modern world.

Q5 What are the most common air Pollutants? Explain any three

Q6 How can the building be more energy efficient?

Section - C

Q7. (a) What you meant by Environment Impact assessment? 2.5

(b) What are the benefits of EIA? 2.5

(C) Explain key element of EIA? 5

Q8. (a) What are renewable energy resources? Explain any four renewable energy resources.

(b) Differentiate between the renewable and non renewable resources.

Q9. Write a short note on

(i) Megacities

(ii) Smart city

(iii) Metros and

(iv) Sea canals.

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Total No. of Questions: 09

Total No. of Pages: 02

B. Tech. (CE) (Sem. 3)
FLUID MECHANICS
Subject Code: BTCE-303-18
Paper ID:

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. Section A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. Section B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. Section C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Section – A

Q1

- a) Why does the viscosity of a gas increases with the increase in temperature?
- b) Differentiate between absolute and gauge pressure.
- c) What do you understand by metacentric height?
- d) The diameter of a pipe at the section 1 and 2 are 10 cm and 15cm respectively. Find the discharge through the pipe if the velocity of water flowing through the pipe at the section 1 is 5 m/s.
- e) What do you mean by laminar Boundary layer?
- f) Differentiate between rapidly varied flow and gradually varied flow.
- g) Define Mach number?
- h) What is hydraulic mean depth?
- i) Define boundary layer thickness.
- j) Differentiate between subcritical and supercritical flow.
- k) What is hydraulic jump?

Section – B

Q2. Define the term most economical section of a channel. What are the conditions for the rectangular channel of the best section?

Q3. What do you mean by repeating variables? How are the repeating variables selected for dimensional analysis?

Q4. Find the bed slope of trapezoidal channel of bed width 6m depth of water 3m and side slope of 3H: 4V, when the discharge through the channel is $30\text{m}^3/\text{s}$. Take chezy's constant $C=70$.

Q5. What are the conditions of equilibrium of a floating body and sub-merged body?

Q6. The velocity distribution for flow over a plate is given by

$$u = \frac{3}{4} y - y^2$$

in which u is the velocity in m/s at a distance y m above the plate. Determine the shear stress at $y=0.15\text{m}$. Take dynamic viscosity of fluid as 8.6 poise.

Section - C

Q7. For the laminar flow through a circular pipe, derive an expression

- (i) The velocity variation.
- (ii) Ratio of Max velocity to Average velocity to Average velocity.
- (iii) Drop of pressure for a given length of pipe.

Q8. What do you mean by boundary layer separation? How will you determine whether a boundary layer flow is attached flow detached flow or on the verge of separation:

For the velocity profiles given below, state whether the boundary layer has separated or on the layer of separation

(i) $u/v = 2(y/\delta) - (y/\delta)^2$

(ii) $u/v = 3/2(y/\delta)^2 + 1/\delta(y/\delta)$

Q9 State Bernoulli's theorem. Derive an expression for Bernoulli's theorem and state the assumptions made for such a derivation

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Total No. of Questions: 09

Total No. of Pages: 02

B. Tech. (CE) (Sem. 3)
Mathematics -III
Subject Code: BTAM-301-18
Paper ID:

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. Section A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. Section B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. Section C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Section - A

- a) What are orthogonal curvilinear co-ordinates?
- b) State Gauss Divergence theorem.
- c) State Stoke's theorem.
- d) Prove $L(e^{at} f(t)) = F(s-a)$, where a is any real or complex
- e) What is Relationship between Laplace & Fourier transform.
- f) What do you mean by Dirichlet's conditions?
- g) What do you mean by even and odd function? Give Example.
- h) Prove that $L(f(at)) = \frac{1}{a} F\left(\frac{s}{a}\right)$
- i) Define solenoidal and irrotational vector.
- j) What is linear property of Laplace transform?

Section - B

Q2. Find Laplace transform of (i) $t e^{-t} \sin 4t$ (ii) Evaluate Laplace Inverse of $\frac{1}{s(s+1)^2}$

Q3. Find the work done moving a particle in the field given by $F = 3x^2 \hat{i} + (2xz - y) \hat{j} + zk^2$ along the curve defined by $x^2 = 4y$ and $x^3 = \frac{8}{3}z$ from $x=0$ to $x=2$.

Q4. Find Laplace transform of unit impulse function.

Q5. Expand $f(x) = x$ as a sine half range series in $0 < x < 2$

Q6. State and prove convolution theorem for Fourier transform.

Section - C

Q7. Verify green theorem in plane for $\oint e^{-x} \sin y \, dx + e^{-x} \cos y \, dy$ where C is the rectangle with the vertices $(0,0)$ $(\pi,0)$ $(\pi,\frac{\pi}{2})$ and $(0,\frac{\pi}{2})$

Q8. Find the Fourier series for $F(x) = \begin{cases} \pi + x, & -\pi < x < 0 \\ 0, & 0 \leq x < \pi \end{cases}$

Hence prove that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \dots = \frac{\pi^2}{8}$

Q9. (a) Find the Fourier transform of $e^{-\frac{t^2}{2}}$ and show that will be $e^{-\frac{s^2}{2}}$

(b) By using convolution theorem find the inverse Laplace of $\frac{1}{(s^2(s^2+1))}$

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B. Tech. (CE) (Sem. 3)
SOLID MECHANICS
Subject Code: BTCE-302-18
Paper ID:

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. Section A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. Section B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. Section C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

Section - A

1.
 - a) Define Mohr's first and second Theorems.
 - b) . What do you understand by the term 'section modulus'?
 - c) What do you understand by the terms 'point of contraflexure' and 'point of maximum bending moment'?
 - d) What is the difference between a strut and a column?
 - e) What is the maximum bending moment in a simply supported beam of span "L" and carrying uniformly distributed load of intensity w per unit length?
 - f) Discuss the failure for long and short columns.
 - g) What do you mean by 'pure bending'?
 - h) Explain the term 'torsional rigidity'.
 - i) Briefly explain the maximum principal stress theory of failure.
 - j) What is the difference between cylindrical and spherical shells?

Section – B

2. A simply supported beam of length 9 meters rests on supports 7 meter apart, with an overhang of 1 meter on each side. The beam carries a u.d.l. of 2kN/meter over the entire length. Draw S.F. and B.M. diagrams and find the points of contra-flexure, if any.
3. Derive Bending Equation and also write its assumptions.
4. Draw stress strain diagram for ductile material and explain it briefly.

5. A cantilever 1.5 m long is loaded with UDL of 2 kN/m run over a length of 1.25 m from the free end. It also carries a point load of 3 kN at a distance of 0.25 m from the free end. Draw the SF and BM diagrams of the cantilever.
6. A bar of steel is of length L and is of the uniform thickness T . The width of the bar varies uniformly from a at one end to b at the other end. Find the extension of the rod when it carries an axial pull P .

Section - C

7. A beam AB of span 8 metres is simply supported at both ends. It carries a uniformly distributed load of 30 kN/m over its entire length and a concentrated load of 60 kN at 3 metres from the support A. Determine the maximum deflection in the beam and location where the deflection occurs. Take: $E = 200 \times 10^6 \text{ kN/m}^2$ and $I = 80 \times 10^{-4} \text{ m}^4$. Use Macaulay's Method.
8. Derive the Euler's Formula for different end conditions.
9. A solid steel shaft is subjected to a torque of 45 kNm. If the angle of twist is 0.5° per metre length of the shaft and the shear stress is not to be allowed to exceed 90 MN/m^2 find:
 - (i) Suitable diameter for the shaft;
 - (ii) Final maximum shear stress and angle of twist; and
 - (iii) Maximum shear strain in the shaft.

Take: $C = 80 \text{ GN/m}^2$

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Total No. of Questions: 09

Total No. of Pages: 02

B. Tech. (CE) (Sem. 3)
Surveying & Geomatics
Subject Code: BTCE-301-18
Paper ID:

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. Section A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. Section B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. Section C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION A (10×2)

- (a) What are the two basic principles of surveying?
- (b) What is meant by orientation of the table in plane table surveying?
- (c) What is Baseline? List the methods for baseline measurements.
- (d) Define local attraction and how to detect it.
- (e) What is the term transiting in Theodolite?
- (f) Discuss advantages of indirect methods of contouring.
- (g) What is reciprocal leveling? Where one can use this leveling?
- (h) What is stereoscopic vision?
- (i) What are the types of EDM instrument?
- (j) Define terms: Focal length and Flight line

SECTION B (4×5)

- Q2. The table below gives the lengths and bearings of lines of a traverse $\triangle ABCDE$, the length and bearing of $\triangle EA$ having been omitted. Calculate the length and bearing of the lines EA.

Line	Length	Bearing
AB	204	$87^{\circ} 30'$
BC	228	$20^{\circ} 20'$
CD	187	$280^{\circ} 0'$
DE	192	$210^{\circ} 3'$
EA	?	?

Q3. A tachometer was setup at A station at the reading on a vertically held staff at B where 2.255, 2.805, and 2.955 the line of sight being at an inclination of $+8^{\circ} 24'$. Another observation on the 1.640, 1.920 and 2.00, the inclination of the line of sight being $+1^{\circ} 6'$. Calculate the horizontal distance between A and B, and the elevation of B if the R.L of B.M is 418.685m. The constant of the instrument were 100 and 0.3.

Q4. An instrument was setup at P and the angle of elevation to a vane 4m above the foot of the staff held at Q was $9^{\circ} 30'$. The horizontal distance between P and Q was known to be 2000 meters. Determine the R.L of the staff Station Q, given that the R.L of the instrument axis was 2650.38m.

Q5 Explain with the help of a neat sketch an idealized Remote sensing system.

Q 6 What are the special methods of spirit leveling?

SECTION C (2×10)

Q7. Two straights AB and BC are intersected by a line D_1D_2 . The angles BD_1D_2 and BD_2D_1 are $40^{\circ} 30'$ and $36^{\circ} 24'$ respectively. The radius of the first arc is 600 meters and that of the second arc is 800 meters. If the chainage of intersection point B is 8248.1 meters, find the chain ages of the tangent points and point of compound curvature.

Q8 The following staff readings were observed successively with a level, the instrument having been moved after third, sixth and eighth readings: 2.228; 1.606; 0.988; 2.090; 2.864; 1.262; 0.602; 1.982; 1.044; 2.684 meters.

Enter the above reading in a table and calculate the R.L of points if the first reading was taken with a staff held on a bench mark of 432.384 m.

Q9 Describe with help of sketches the characteristics of contours.