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FACULTY OF SCIENCE, ENGINEERING, INFORMATION TECHNOLOGY, ART AND DESIGN

DEPARTMENT OF ELECTRICAL ENGINEERING UNIVERSITY EXAMINATIONS 2024/2025

COURSE	:	**BEE / BCE**
PAPER Name	:	**COMPUTER PROGRAMING**
CODE	:	**BCP3201**
SEMESTER	:	**THREE**
DATE	:	**28th April 2025**
TIME	:	**2pm – 5pm**
DURATION	:	**3HRS**

INSTRUCTIONS:

- This examination paper consists of **EIGHT** question **Three** pages.
- Answer **any ~~Five~~ 4** questions for full marks
- The weight of each question is indicated.
- Submit all used answer booklets.
- Use the booklet provided to you to answer the questions.

Question One (25 Marks)

i. What is a control structure in C programming? *[2 Mark(s)]*
ii. Name the three main types of control structures in C. *[3 Mark(s)]*
iii. What is a conditional statement? *[2 Mark(s)]*
iv. What are the two main components of conditional statements? *[2 Mark(s)]*
v. What is the purpose of an if statement in C? *[2 Mark(s)]*
vi. Write the syntax of an if statement. *[3 Mark(s)]*
vii. Sketch the flowchart for an if statement. *[3 Mark(s)]*
viii. What happens if the condition in an if statement is false? *[2 Mark(s)]*
ix. How does an if-else statement differ from an if statement? *[2 Mark(s)]*
x. Write the syntax for an if-else statement. *[4 Mark(s)]*

Question Two (25 Marks)

i. What is a while loop in C? *[2 Mark(s)]*
ii. Write the syntax of a while loop. *[3 Mark(s)]*
iii. Write a while loop that prints numbers from 1 to 10. *[5 Mark(s)]*
iv. What is the difference between a while loop and a do-while loop? *[2 Mark(s)]*
v. Write the syntax of a for loop. *[3 Mark(s)]*
vi. How does a for loop differ from a while loop? *[2 Mark(s)]*
vii. Write an example of a nested loop that prints a 3x3 matrix. *[8 Mark(s)]*

Question Three (25 Marks)

i. What is a function in C programming? *[2 Mark(s)]*
ii. Differentiate between function declaration and function definition. *[2 Mark(s)]*
iii. Write the syntax of a function declaration *[3 Mark(s)]*
iv. Write the syntax of a function definition *[3 Mark(s)]*
v. What is the purpose of the return statement in a function? *[2 Mark(s)]*
vi. How do you call a function in C? *[4 Mark(s)]*
vii. What is the difference between standard library functions and user-defined functions? Provide an example of each. *[6 Mark(s)]*
viii. What does it mean when a function has a return type of void? *[3 Mark(s)]*

Question Four (25 Marks)

i. What is the purpose of a switch statement in C? *[2 Mark(s)]*
ii. Write the syntax for a switch statement. *[4 Mark(s)]*
iii. Sketch the flowchart for a switch statement. *[5 Mark(s)]*
iv. How does a switch statement differ from an if-else statement? *[2 Mark(s)]*
v. What happens if the break statement is omitted inside a switch case? *[2 Mark(s)]*
vi. What is the role of the default case in a switch statement? *[2 Mark(s)]*
vii. Write a switch statement that prints the name of a day based on an integer input (1 for Monday, 2 for Tuesday, etc.). *[8 Mark(s)]*

Question Five (25 Marks)

i. Give reasons why C has become a widely professional language. Also give facts about the C programming language. **(5 Marks)**

ii. C was initially used for system development , particularly the programs that make-up the operating system. C was adopted as a system development language because it produces a code that runs nearly as fast as the code written in assembly language. Give some of the examples where C might be used. **(5 Marks)**

iii. Which extensions are used in C Programs? **(5 Marks)**

iv. When you want to set up your environment for C programing language, what software tools should be available on your computer? **(3 Marks)**

v. Using the Hello World Example below **(7 Marks)**

```
1  #include <stdio.h>
2
3  int main()
4  {
5      /* my first program in C */
6          printf("Hello, World! \n");
7
8          retun 0;
9
10 }
```

i) What parts makeup a C programming language?

ii) With reference to the diagram above, explain ***#include <stdio.h>, int main() , /*..*/, printf(...) and return 0;***

Question Six (25 Marks)

i. Describe the types of decision-making statements that C programming language provides. **(5 Marks).**

ii. Give the syntax of an if...else statement with its Flow Chart Diagram used in C programming language. **(5 Marks).**

iii. For the program below

```
1   #include <stdio.h>
2   extern int a,b;
3   extern int c;
4   extern float f;
5
6   int main ()
7   {
8      /* variable definition: */
9      int a,b;
10     int c;
11     float f;
12
13     /* actual initialization */
14        a=10;
15        b=20
16
17        c=a+b;
18        printf("value of c : %d\n", );
19
20        f= 70.0/3.0;
21        printf("value of f : %f\n", f);
22
23        return 0;
24
25  }
```

a) Find the errors and give the right code. **(5 Marks).**

b) Rewrite the program to give the correct code that will compile and run without giving errors. **(10 Marks).**

..... END.....

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FACULTY OF SCIENCE, TECHNOLOGY, ENGINEERING, ART AND DESIGN

DEPARTMENT OF CIVIL ENGINEERING

UNIVERSITY EXAMINATIONS 2022/2023

COURSE	:	BACHELOR OF SCIENCE IN CIVIL ENGINEERING
PAPER	:	STRUCTURAL DESIGN II
CODE	:	BCE 3204
SEMESTER	:	TWO
DATE	:	THURSDAY, 16TH NOVEMBRE 2023
TIME	:	08 00 HRS – 11 00HRS
DURATION	:	3HRS

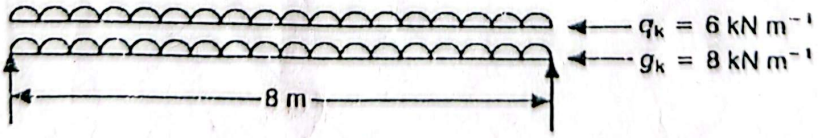
INSTRUCTIONS:

- The paper has ***EIGHT*** questions.
- Attempt ***FOUR*** questions
- All questions carry Equal Marks

Question One (25 marks)

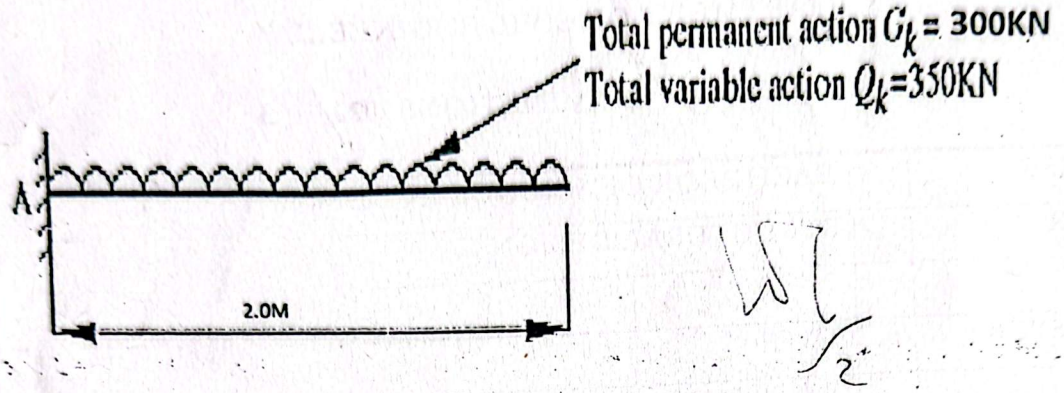
(a) Explain four different classes of steel for the Universal Beam (4Marks)

(b) Check the suitability of 356 × 171 × 51 kg m UB section in S275 steel loaded by uniformly distributed loading q_k = 8 kN /m and g_k = 6 kN /m as shown below. Assume that the beam is fully laterally restrained and that thebeam sits on 100 mm bearings at each end. Ignore self-weight of beam. (21 Marks)



Question Two (25 marks)

(a) A cantilever beam is needed to resist the loading shown below. Check whether a, 305×610 ×149 kg/m UB section in S 275 steel to satisfy bending and shear criteria only assuming full lateral restraint. (15 Marks)



b) Explain the five different modes of failure in steel structures. (10 Marks)

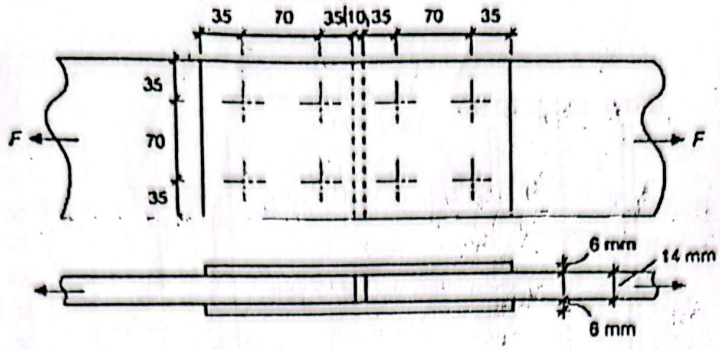
Question Three (25 marks)

(a) Explain the three Major requirements in design of steel structure (10 Marks)

(b) A 305 × 305 × 137 UC section extends through a height of 3.5 metres and fixed at both ends. Check whether this member is suitable to support a design axial permanent load of 600 kN together with a major axis variable bending moment of 300 kNm applied at the top of the element. Assume S275 steel is to be used and that all effective length factors are 0.85. (15 Marks)

Question Four (25 marks)

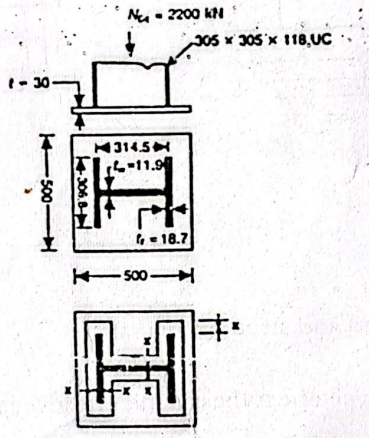
Check whether the connection detail shown below can resist a shear force of 450KN. The cover plates are made of S275 steel and connected with non-preloaded bolts of diameter 20 mm and class 4.8 .Assume the shear plane passes through the unthreaded portion of the bolt.(25 Marks)



Question Five (25 marks)

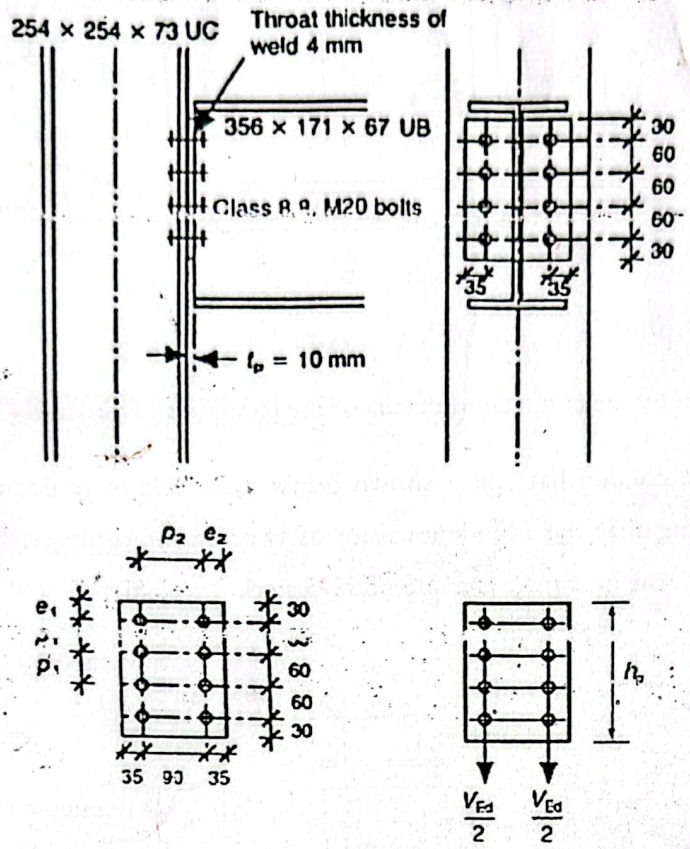
(a) Using a sketch draw the connection details of the base plate to pedestal (7 Marks)

(b) Check that the column base plate shown below is suitable to resist an axial design load, N_{ed} =2200KN .Assuming that the foundations are of concrete of compressive cylinder strength, f_{ck} =30N/mm^2 and that the base plate is made of S275 steel. (18 marks)



Question Six (25 marks)

The beam shown below is to be connected to a column using eight class 10.9, M16 bolts as shown below, calculate the maximum shear resistance of the connection.(25 Marks)



Question Seven (25 marks)

(a) Differentiate between a column and strut (2 Marks)

(b) State five end conditions that will affect the column effective length (5 marks)

(c)check the suitability of the 203x203x60Kg/m UC section in S275 steel to resist a design axial force of 1000KN .Assume the effective length of the column is 6000mm.(18 Marks)

Question Eight (25 marks)

Check the suitability of a 305x305x198UC ,3.5m high pinned at both ends to support a design axial permanent load of 700KN together with a major axis design bending moment of 450KNM applied at top of the column .Assume S 275 steel is to be used and all effective length are unity. (25 Marks)

Test for Structural Design II

Answer all questions *Time 1.5 HRS*

Question One

(a) check a suitable beam section 356×171×51 kg/m UB using S 275 steel to support the loads on the first floor shown below. Assume beam is fully laterally restrained and that it sits on 125 mm bearings at each end. Check whether the beam is safe against

(i). Bending (5 Marks)

(ii). Shear (5 Marks)

(iii). Bending and shear. (2 Marks)

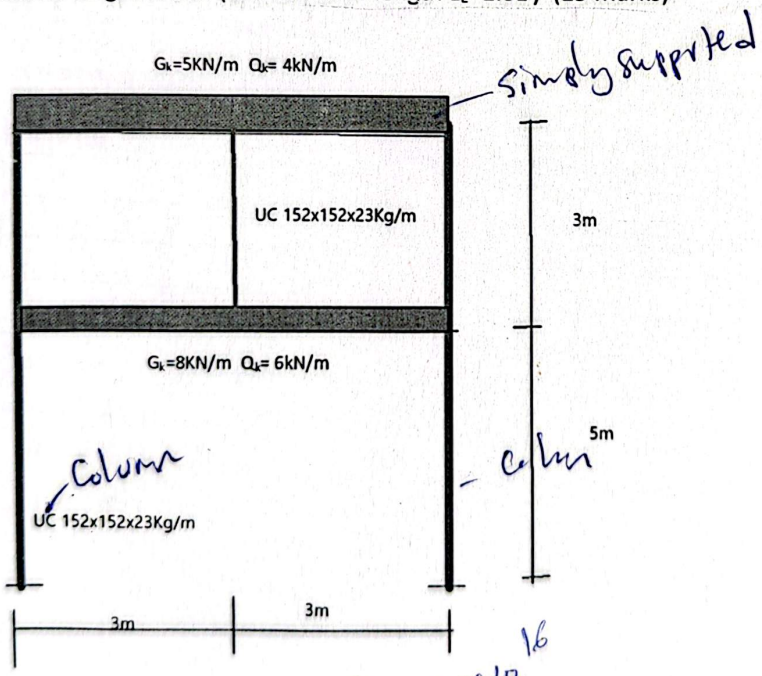
(iv). Resistance flange induced buckling (3 Marks)

(v). Deflection.(5 Marks)

Question Three

(a) Explain the three Major requirements in design of steel structure (10 Marks)

(b) Check the suitability of the 152 × 152 × 23 kg /m . Assume the column is pinned at both ends and that its height is 5m. (Use Effective length L_E=1.0L) (15 Marks)



MUTEESA I ROYAL UNIVERSITY

COURSE NAME: HYDROLOGY II
TEST- KAKEEKA CAMPUS
TIME: 1:30HRS

INSTRUCTIONS
1. **All questions carry the same marks.**
2. **Answer all questions.**

QUESTION ONE
A. Describe giving examples, any five evidences of climate change in Uganda. **(10 marks)**
B. Describe any discuss the five components of climate change **(10 marks)**
C. Describe two recent environmental changes that provide evidence for global warming. **(5marks)**

QUESTION TWO
A. Define the following terms in urban hydrology; **(6 marks)**
i) Sedimentation
ii) Detention basin
iii) Urban Hydrology
B. Describe any three storm water management practices that you know. **(3 marks).**
C. Describe any three 3 challenges and their respective possible solutions faced in storm water management. **(6 marks).**
D. Given a trapezoidal channel that has n as 0.015, S as 0.002 and side slopes of 1vertical to 2 horizontal, find the mean velocity and Discharge. **(10 marks).**

QUESTION THREE
A. Describe the two classification of models as applied in hydrology. **(6marks).**
B. Rainfall loss is the portion of precipitation that does not immediately runoff after a storm. Explain any four causes of rainfall losses. **(4 marks).**
C. The ordinates of a 6 unit hydro-graph are given. A storm had 3 successive 6hour interval of rainfall magnitude of 3, 5, 4 cm, respectively. Assuming a phi index of 0.2cc/hr and a base floor of $30m^3/s$. Determine the resulting hydro-graph of flow. **(15 marks).**

Time (h)	Ordinates of 6 hr UH M^3/s
0	0
6	250
12	600
18	800
24	700
30	600
36	450
42	320
48	200
54	100
60	50
66	0

END

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FACULTY OF SCIENCE, TECHNOLOGY, ENGINEERING, ART AND DESIGN

DEPARTMENT OF CIVIL ENGINEERING

UNIVERSITY END OF SEMESTER EXAMINATION 2024

COURSE	:	**BACHELOR IN CIVIL ENGINEERING**
PAPER	:	**PUBLIC HEALTH AND ENVIRONMENTAL ENGINEERING I**
CODE	:	**BCE 3203**
SEMESTER	:	**TWO**
DATE	:	**23/04/2025**
TIME	:	**08 00 – 11 00**
DURATION	:	**3 HRS**

INSTRUCTIONS:

- *Answer any **FOUR** questions*
- *Begin each question on a fresh page*
- *All questions carry equal marks*

Question One [25 Marks]

Discuss the following with regards to Public Health and Environmental Engineering

a) Solid waste generation
b) Solid waste sorting
c) Solid waste storage
d) Solid waste collection
e) Solid waste transportation (25 marks)

Question Two [25 Marks]

a) Describe any five (5) technologies for the treatment of solid waste. (10 marks)
b) Explain any five (5) methods of ultimate disposal of solid waste. (15 marks)

Question Three [25 Marks]

a) Describe the key differences between vermicomposting and bokashi composting in organic waste management. (10 marks)
b) Explain any five (5) key aspects of hazardous waste management. (15 marks)

Question Four [25 Marks]

a) Describe the significant sources of air pollution and their impact on human health and ecosystems. (10 marks)
b) Differentiate between temporary hardness and permanent hardness in water, highlighting their causes and methods of removal. (15 marks)

Question Five [25 Marks]

a) Identify the key components of sanitation, and explain their contribution to public health and environmental sustainability. (10 marks)
b) Describe the historical developments in sanitation and their influence on modern public health practices. (15 marks)

Question Six [25 Marks]

a) Explain how a septic tank separates and treats wastewater before discharging effluent into the drainage field. (10 marks)
b) Outline the key design considerations for a septic tank, including the required chamber sizes and construction materials. (15 marks)

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FACULTY OF SCIENCE, TECHNOLOGY, ENGINEERING, ART AND DESIGN

DEPARTMENT OF CIVIL ENGINEERING

UNIVERSITY CONTINOUS ASSESSMENT TESTS

COURSE	:	BACHELOR IN CIVIL ENGINEERING
PAPER	:	WATER RESOURCES ENGINEERING 1
CODE	:	BCE 3205
SEMESTER	:	TWO
DATE	:	29/3/2023
TIME	:	8:30am - 9:30am
DURATION	:	1 HR

INSTRUCTIONS:

- *Attempt any **THREE** Questions*
- *Begin each question on a fresh page*
- *All questions carry equal marks*

Question One

a) Water Resources Engineering is beneficial to the society. Discuss (5 marks)

b) Write short note on the impact of Water Resources Engineering on the Environment. (5 marks)

Question Two

a) Discuss key aspects of water availability in Uganda (5 marks)

b) Outline the challenges of water availability in Uganda. (5 marks)

Question Three

a) Discuss any five (5) water management issues in Uganda. (5 marks)

b) Outline (5) key aspects of integrated water resources management. (5 marks)

Question Four

a) Explain any five (5) aspects of rural water supply and sanitation. (5 marks)

b) Identify the Government policies for rural water supply and sanitation in Uganda. (5 marks)

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DEPARTMENT OF CIVIL ENGINEERING
UNIVERSITY CONTINOUS ASSESSMENT TESTS

COURSE	:	**BACHELOR IN CIVIL ENGINEERING**
PAPER	:	**PUBLIC HEALTH AND ENVIRONMENTAL ENGINEERING 1**
CODE	:	**BCE 3203**
SEMESTER	:	**TWO**
DATE	:	**29/3/2025**
TIME	:	**8:30am - 9:30am**
DURATION	:	**1 HR**

INSTRUCTIONS:

- *Attempt any **THREE** Questions*
- *Begin each question on a fresh page*
- *All questions carry equal marks*

Question One

a) Describe the methods of control and management of rodents (5 marks)

b) Describe five (5) ways of addressing sub – standard housing. (5 marks)

Question Two

a) Describe five (5) current issues in public and environmental health in Uganda (5 marks)

b) Write short notes on any five (5) environmental laws in Uganda (5 marks)

Question Three

a) Write short note on National Environment act (5 marks)

b) Identify components solid waste management and explain any 1 (one) of them. (5 marks)

Question Four

a) Explain waste composition analysis. (5 marks)

b) Differentiate between bio – degradable and non-bio – degradable waste with examples. (5 marks)

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FACULTY OF SCIENCE, TECHNOLOGY, ENGINEERING, ART AND DESIGN

DEPARTMENT OF CIVIL ENGINEERING

UNIVERSITY END OF SEMESTER EXAMINATION

COURSE	:	**BACHELOR IN CIVIL ENGINEERING**
PAPER	:	**WATER RESOURCES ENGINEERING I**
CODE	:	**BCE 3205**
SEMESTER	:	**TWO**
DATE	:	
TIME	:	
DURATION	:	**3 HRS**

INSTRUCTIONS:

- *Answer Question* **(1) OR (2)** *and any other THREE Questions*
- *Begin each question on a fresh page*
- *All questions carry equal marks*

Question 1 [25 Marks]

a) Highlight any two (2) features of hydrologic and hydraulic flood routing respectively. (10 marks)

b) Route the following flood hydrograph through a river reach for which K = 12.0h and x = 0.20. At the start of the inflow flood, the outflow discharge is $10m^3/s$. (15 marks)

Time (h)	0	6	12	18	24	30	36	42	48	54
Inflow (m^3/s)	10	20	50	60	55	45	35	27	20	15

Question 2 [25 Marks]

a) Describe any method used to determine hydraulic conductivity (10 marks)

b) Determine the hydraulic conductivity of a confined aquifer 5m thick which gives a steady discharge of 0.02 m^3/sec. The height of water in the well which was 10m above the base before pumping dropped to 8m. Take the radius of observation well as 0.3m and 300m. (15 marks)

Question 3 [25 Marks]

a) Outline five (5) strategies to achieve sustainability in rural water supply (10 marks)

b) Describe five (5) appropriate technologies for water supply and sanitation. (15 marks)

Question 4 [25 Marks]

a) Identify any three (3) physical and three (3) anthropogenic factors which affect flooding (9 marks)

b) Provide details of any four (4) 'hard' and four (4) 'soft' engineering techniques for flood mitigation. (16 marks)

Question 5 [25 Marks]

a) Describe any five (5) flood –proofing techniques (10 marks)

b) Write short note on design of hydraulic structures (15 marks)

Question 6 [25 Marks]

a) Write short notes on:

i. Saturation zone

ii. Zone of aeration (8 marks)

b) Outline any four (4) impacts of flooding (8 marks)

c) Discuss:

i. Channel routing

ii. Reservoir routing

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DEPARTMENT OF CIVIL ENGINEERING

UNIVERSITY EXAMINATIONS **2024/2025**

COURSE	:	**BCE III**
PAPER	:	**Structural design II**
CODE	:	BCE 3203
SEMESTER	:	ONE
DATE	:	25/04/2025
TIME	:	**08 00 – 11 00am**
DURATION	:	**3HRS**

INSTRUCTIONS:

- The paper has ***SIX*** questions.
- Attempt ***FOUR*** questions
- All questions carry Equal Marks
- Students are allowed to use EC 3,EC 8 and steel tables

Question One (25 Marks)

(a) Check a suitable beam section 356×171×51 kg/m UB using S 275 steel to support the loads on the first floor shown Figure 1. Assume beam is fully laterally restrained and that it sits on 125 mm bearings at each end. Check whether the beam is safe against

(i). Bending (10 Marks)

(ii). Shear (5 Marks)

(iii). Bending and shear. (2 Marks)

(iv). Resistance flange induced buckling (3 Marks)

(v). Deflection.(5 Marks)

Question Two (25 Marks)

(a) Explain the three Major requirements in design of steel structure (10 Marks)

(b) Check the suitability of the 152 × 152 × 23 kg /m . Assume the column is pinned at both ends and that its height is 5m. (Use Effective length L_E=1.0L) (15 Marks)

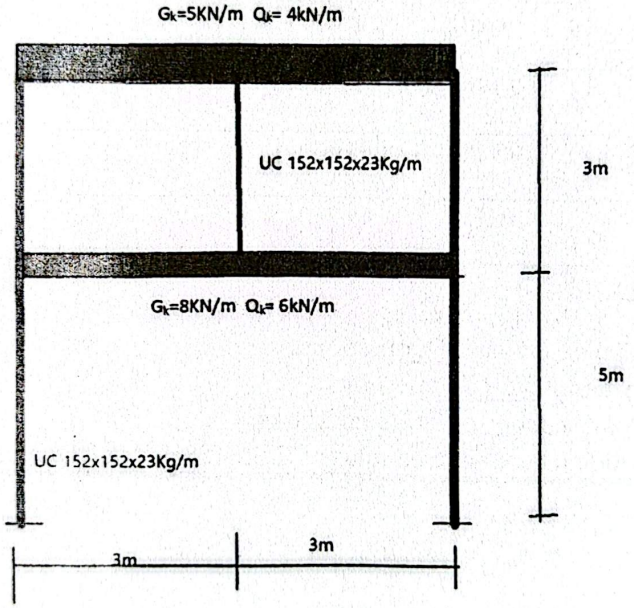
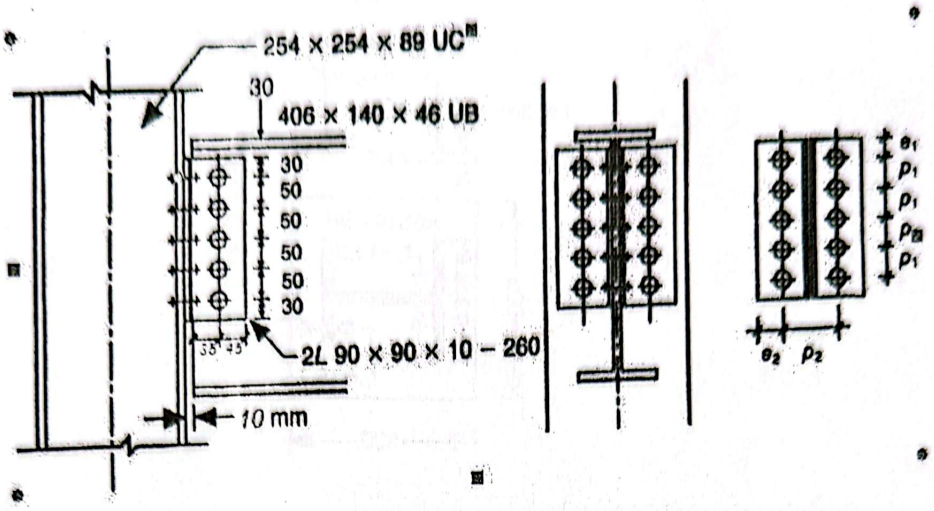
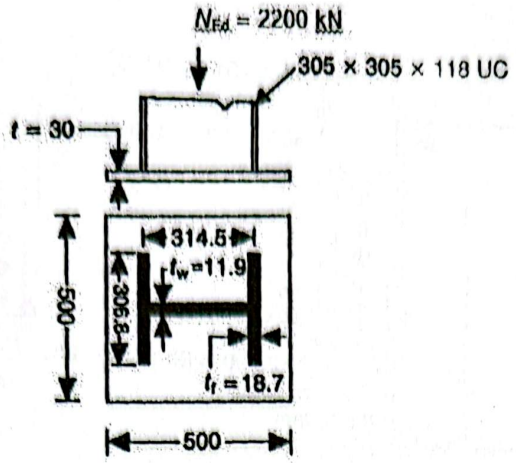


Figure 1

Question three (25 Marks)

Check that the column baseplate shown below is suitable to resist an axial design load, N_{Ed}, of 2200 kN. Assume thatthe foundations are of concrete of compressive cylinder strength, f_{ck}, of 30 N mm^{-2} and that the baseplate is made of S275 steel.


254 × 254 × 89 UC
30
406 × 140 × 46 UB
30
50
50
50
50
30
2L 90 × 90 × 10 – 260
10 mm
e1
p1
p1
p2
p1
e2
p2



Question Four (25 Marks)

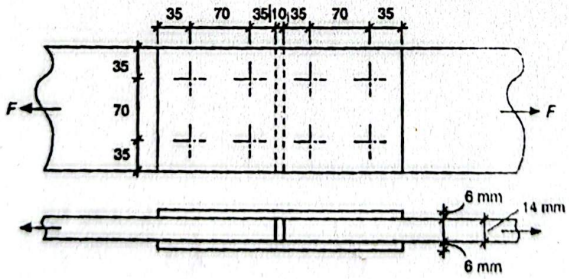
A 305 X 305 X 137 UC section extends through a height of 3.5 metres and is pinned at both ends. Check whether thismember is suitable to support a design axial load of 810 kN together with a major axis design bendingmoment of 450 kNm applied at the top of the element. Assume S275 steel is to be used and that all effective lengthfactors are unity.(25 Marks)

Question five (25 Marks)

(a) Explain the difference between the end and edge distance (4 marks)

(b) Calculate the design resistance of the connection detail shown below. The cover plates are made of S275 steel andconnected with non-preloaded bolts of diameter 16 mm and class 4.6

Assume that in both cases, the shear plane passes through the unthreaded portions of the bolts. (21 Marks)



Question six (25 Marks)

Show that the double angle web cleat beam-to-column connection detail shown below is suitable to resist the designshear force, V_{Ed}, of 200 kN. Assume the steel grade is S 275 and the bolts are class 8.8 and diameter20 mm. (25 Marks)

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FACULTY OF SCIENCE, ENGINEERING, INFORMATION TECHNOLOGY, ART AND DESIGN
DEPARTMENT OF CIVIL ENGINEERING
END OF SEMESTER II EXAMINATION 2024/2025
YEAR III
BCE3202: HYDROLOGY II
DURATION: 3 Hours

INSTRUCTIONS:

This examination paper consists of SEVEN question Four pages.
Answer any Four questions for full marks.
All questions carry equal marks as shown.

QUESTION ONE (25 Marks)

A. Explain the greenhouse effect and give the role of greenhouse gases and how human activities contribute to their increase in the atmosphere. (10 marks).
B. Discuss at least five various approaches to mitigate climate change effects. (10 marks).
C. Give two examples and reasons why climate change models could be expected to have difficulty projecting future climates. (5 marks)

QUESTION TWO (25 Marks)

A. List the two classification of models as applied in hydrology. (2 marks).
B. Rainfall loss is the portion of precipitation that does not immediately runoff after a storm. Explain any four causes of rainfall losses. (8 marks)
C. Given the data set below for the rainfall. Use the given data to determine the mean, and standard deviation. (15 marks)

Year	Precipitation	
1970	33.9	
1971	31.7	
1972	31.5	
1973	59.6	
1974	59.6	
1975	38.6	
1976	43.4	
1977	28.7	
1978	32.0	
1979	51.8	

QUESTION THREE (25 Marks)

A. Describe giving examples, any five evidences of climate change in Uganda. **(10 marks)**

B. Describe any discuss the five components of climate change **(10 marks)**

C. Describe two recent environmental changes that provide evidence for global warming. **(5marks)**

QUESTION FOUR (25 Marks)

A. Define the following terms in urban hydrology; **(6 marks)**

i) Sedimentation

ii) Detention basin

iii) Urban Hydrology

B. Describe any three storm water management practices that you know. **(3 marks).**

C. Describe any three 3 challenges and their respective possible solutions faced in storm water management. **(6 marks).**

D. Given a trapezoidal channel that has n as 0.015, S as 0.002 and side slopes of 1vertical to 2 horizontal, find the mean velocity and Discharge. **(10 marks).**

QUESTION FIVE (25 Marks)

A. Describe the two classification of models as applied in hydrology. **(6marks).**

B. Rainfall loss is the portion of precipitation that does not immediately runoff after a storm. Explain any four causes of rainfall losses. **(4 marks).**

C. The ordinates of a 6 unit hydro-graph are given. A storm had 3 successive 6hour interval of rainfall magnitude of 3, 5, 4 cm, respectively. Assuming a phi index of 0.2cc/hr and a base floor of $30m^3/s$. Determine the resulting hydro-graph of flow. **(15 marks).**

Time (h)	Ordinates of 6 hr UH M^3/s
0	0
6	250
12	600
18	800
24	700
30	600
36	450
42	320
48	200
54	100
60	50
66	0

QUESTION SIX (25 marks)

A. Define the following terms;- **(3 marks)**

i. Bio Chemical oxygen (BOD)

ii. Dissolved oxygen (DO)

iii. Oxygen sag curve

B. Discuss any four factors influencing the oxygen sag curve. **(8marks)**

C. Discuss any four purposes of water quality models. **(8marks)**

D. Assuming a sample that has 100mL of 2M solution and diluted to a final volume of 500mL, Determine the resulting final concentration. **(6marks)**

END-GOOD LUCK

C_1V_1

$\frac{2 \times 600}{500}$